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FIELD TRACER MEASUREMENT
OF AERATION PERFORMANCE

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OF AERATION PERFORMANCE

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SUMMARY

Aerobic biological oxidation of organics in wastewater is a widely used method of wastewater treatment. In such a process, microorganisms utilize dissolved oxygen from the water while oxidizing the organics. If the treatment process is to utilize high oxidation rates, the wastewater must be artificially aerated in order to maintain the dissolved oxygen concentrations necessary for the survival of the microorganisms.

Until now, there has been no method available to measure aeration equipment performance under process conditions. Therefore, equipment selection by the design engineer has been on the basis of performance claims that could not be verified or disproved once the equipment was installed.

This study presents and demonstrates a new field method suggested earlier by Tsivoglou for making direct measurement of aeration performance under process conditions. Basically, the new method employs the simultaneous use of a gaseous radioactive tracer (krypton-85) for oxygen and a conservative dispersion tracer (tritiated water). The two radioactive tracers are released as a single homogeneous dose in the aeration basin being tested. The tritium is dispersed according to the mixing characteristics of the system and the krypton-85, present as a dissolved gas, undergoes the same dispersion, and, additionally is lost to the atmosphere by physical gas transfer. From the aeration basin, samples are taken as a function of time and the krypton-85 transfer rate coefficient is evaluated on the basis of the rate of change of the concen-

tration ratio of krypton-85 relative to tritium. It has been demonstrated in the studies of others that the gas exchange coefficient of krypton-85 is 83 percent of the exchange coefficient for oxygen, and that this ratio is constant under a wide variety of conditions of turbulence, temperature, direction of gas transfer, wastewater characteristics, etc. The field determined values of the gas transfer coefficient for krypton-85 are therefore readily converted to values of the oxygen transfer coefficient.

The field tracer studies reported here have demonstrated that the tracer method is practical, and that the results are precise and reproducible for both diffused air and mechanical aeration systems.

Use of the gaseous tracer method can allow design engineers to specify a minimum aeration performance and then test for compliance after the system is in operation.

NOMENCLATURE

AES	Automatic external standard.
α	Ratio of gas transfer rate coefficient for wastewater to that for clean water.
β	Ratio of dissolved oxygen saturation for wastewater to that for clean water.
B	Background counts.
C	Steady state dissolved oxygen concentration (mg/l).
$C_{H,t}$	Tritium concentration at time t.
C_i	Influent dissolved oxygen concentration (mg/l).
$C_{kr,t}$	Dissolved krypton-85 concentration at time t.
C_s	Dissolved oxygen saturation value for clean water (mg/l).
C_{sm}	The approximate oxygen saturation (corresponding to middepth) for a diffused air system (mg/l).
C_t	Dissolved oxygen concentration at time t (mg/l).
DO	Dissolved oxygen concentration (mg/l).
dpm	Disintegrations per minute.
D_t	Dissolved oxygen saturation deficit at time t (mg/l).
e_d	Oxygen transfer efficiency for a diffused air system.
e_{H3}	Tritium counting efficiency.
e_{Kr85}	Krypton-85 counting efficiency.
K_{kr}	Krypton-85 transfer rate coefficient for clean water (min^{-1}).
K_2	Oxygen transfer rate coefficient for clean water (min^{-1}).
L	Influent and effluent flow rate (ft^3/min).

Mev	Million electron volts.
N_a	Oxygen dissolved per unit time at conditions of wastewater, 20°C, and 0 dissolved oxygen (lb O_2/hr).
N_s	Oxygen dissolved per unit time at standard conditions of clean water, 20°C, and 0 dissolved oxygen (lb O_2/hr).
O_t	The percent concentration of oxygen in the air leaving a diffused air system.
P_b	The absolute pressure at the depth of air release in a diffused air system (lb/in^2).
r	Rate of dissolved oxygen utilization (mg/l/min).
R_t	Ratio of $C_{kr,t}$ and $C_{H,t}$ respectively in a single sample taken at time t.
T	Water temperature (°C).
t	Time
θ	Temperature correction coefficient.
V	Volume of water in aeration basin (ft^3).
W	Weight of water in aeration basin (lbs).

CHAPTER I

INTRODUCTION

Aerobic biological oxidation of organic material in wastewater is a widely used method of waste treatment. In such a treatment system, organic matter (food) is consumed and degraded by microorganisms which also utilize oxygen in the process. If an efficient process is used, the microorganisms will utilize dissolved oxygen from the water so rapidly that some means of artificial aeration must be employed to maintain an essential dissolved oxygen concentration for the microorganisms.

Although numerous brand-name aeration devices are available to the aeration system designer, all aeration equipment commonly used in waste treatment can be classified as either air-diffusion units, in which air is released below the water surface, or mechanical surface units, in which the water surface is mechanically agitated to increase the rate of air-water contact. Turbine aeration units, in which air is released below the rotating blades of an impeller, can be considered as a combination of air-diffusion and mechanical aeration. A more detailed description of the various types of aeration equipment is contained in reference(2).

If the engineer is to design an aeration system rationally, he must have information concerning the oxygen transfer capacity of the equipment being considered. Currently, aeration equipment manufacturers rate their own equipment and supply design information to their customers.

Unfortunately, no satisfactory field method of testing has been available, and the manufacturer's tests have usually been conducted in special test basins filled with "tap" water. As these test conditions do not reflect field conditions, the manufacturer's test data must be applied to design problems with caution.

Both diffused air and mechanical aeration are widely used today, with each equipment manufacture claiming superiority of it's equipment over that of other companies. As no field technique has been available to determine aeration performance under process conditions, manufacturer's performance claims can neither be verified, or disproved.

The purpose of this study is to present and demonstrate a new field technique for aeration performance testing under process conditions. The technique involves the use of a radioactive gaseous tracer for oxygen, and this thesis contains descriptions of the technique and the full-scale demonstration. The gaseous tracer method constitutes a direct measurement of gas transfer capacity under existing hydrodynamic conditions and does not depend on biological or chemical parameters as a test basis.

The tracer method described in this study can be the basis for testing aeration systems for design specification compliance under process conditions. In addition to compliance testing, the tracer method can be used to obtain in situ performance information for various aeration equipment applications and thereby establish a more rational design basis for future applications.

CHAPTER II

THEORETICAL ASPECTS AND HISTORICAL BACKGROUND

Theoretical Aspects

Basic Considerations

Aeration of water is a gas-liquid, mass transfer process that takes place as the result of the combined effects of molecular diffusion of oxygen and physical mixing of the water.

A qualitative description of aeration(3) is best accomplished by considering a hypothetical beaker of water, motionless, exposed to the atmosphere, and initially devoid of oxygen. The oxygen molecules in the overlying air possess an inherent kinetic energy and may be visualized as tiny projectiles moving about in the atmosphere in random directions. Some of the oxygen molecules strike the water surface and a portion of these molecules actually enter the water and become "dissolved". Although some of the dissolved oxygen molecules will escape back to the atmosphere, others will move deeper into the water. As the concentration of oxygen molecules is greater in the uppermost layers of water, the net effect will be for oxygen molecules to "diffuse" downward from a region of higher to a region of lower concentration.

After this diffusion process begins, the dissolved oxygen concentration at any one depth will increase as a smooth, continuous function of time. After a very long time, the entire volume of the beaker will achieve a uniform dissolved oxygen concentration at which time the water is "saturated" with dissolved oxygen molecules. If no other force acts to upset this equilibrium condition, the dissolved oxygen concentration will remain constant with time.

Suppose now that the hypothetical beaker of water described above has some mixing force imparted to the fluid elements. (The mixing force could be the result of mechanical stirring, the bubbling of air into the water or any other method of mixing.) This mixing action allows oxygen-enriched fluid elements (at a gas-liquid interface) to be dispersed to oxygen-deficient regions where they give up some of their dissolved oxygen to other fluid elements that have not been exposed to the air so recently. Mixing greatly increases the net rate of gas transfer as compared to molecular diffusion alone.

Without molecular diffusion no gas transfer could take place; however, molecular diffusion without mixing is a very slow process. For this reason, it may be said that for a given gas-liquid system experiencing constant environmental conditions, the rate of gas transfer is primarily dependent on the degree of turbulent mixing within the liquid.

<u>Basic Aeration Equation</u>

A basic mathematical expression describing aeration of clean water is

$$\frac{d\,D_t}{dt} = -K_2 D_t \tag{1}$$

in which, D_t, is the dissolved oxygen concentration deficit below the saturation limit, in mg/l, at time, t, and, K_2, is the gas transfer rate coefficient for oxygen in clean water (min^{-1}). Equation 1 may also be written as

$$\frac{d\,(C_s - C_t)}{dt} = -K_2\,(C_s - C_t) \tag{2}$$

in which, C_s, is the dissolved oxygen saturation value for clean water and, C_t, is the dissolved oxygen concentration at time, t, both in mg/l.

Equation 1 simply states that the rate of change of the saturation deficit is proportional to the deficit at any time. This formulation is explained and developed in the works of Adney and Becker (4) and Streeter and Phelps (5). Tsivoglou (3) has presented a derivation of Equation 1 from simple and basic considerations of the kinetics of gases.

General Wastewater Aeration Equation

Equation 2 is a basic model for oxygen transfer in a clean water system. Other complicating factors must be accounted for if one is to consider a wastewater system such as that in the activated sludge process. Using Equation 2 as a basis, a general aeration equation may be written as

$$\frac{d(\beta C_s - C_t)}{dt} = -\alpha K_2\,(\beta C_s - C_t) + r \tag{3}$$

in which, C_s, is the dissolved oxygen saturation value for clean water, C_t, is the dissolved oxygen concentration at time, t, both in mg/l, K_2, is the gas transfer rate coefficient for oxygen (1/time) in clean water, β, is the ratio of dissolved oxygen saturation for the wastewater to that for clean water, α, is the ratio of the gas transfer rate coefficient for the wastewater to that for clean water, and, r, is the rate of dissolved oxygen utilization by the organisms in the system.

It is important to note that the actual gas transfer coefficient for oxygen in a real wastewater system is equal to the product of, α, and K_2. Similarly, the actual dissolved oxygen saturation limit in a real wastewater system is equal to the product of, β, and C_s. The net gas transfer in a real system is determined by the actual gas transfer coefficient and the actual dissolved oxygen saturation limit existing in the system. For the purposes of this study, actual oxygen transfer rate coefficients will be designated as, αK_2, and the actual dissolved oxygen saturation limit will be designated as, βC_s.

Dissolved Oxygen Saturation Limit in Clean Water (C_s). Values of, C_s, may be taken from Standard Methods (6) or other sources (7) by knowing the water temperature, the prevailing barometric pressure, and the pressure of saturated water vapor at the specified water temperature.

In diffused aeration systems, where air is released at some depth below the free water surface, the solubility of oxygen is influenced by the increased partial pressure of oxygen in the air bubbles that have been compressed by the weight of the water above, and by the decreasing partial pressure as oxygen is absorbed from the bubbles.

Eckenfelder (8) gives an expression for computing the approximate mean saturation value (corresponding to middepth) for such systems:

$$C_{sm} = C_s \left(\frac{Pb}{14.7 \text{ psi}} + \frac{O_t}{21\%} \right) \frac{1}{2} \tag{4}$$

in which, C_{sm}, is the mean saturation value for clean water in the system and, C_s, is the "book value" for saturation as previously described, both in mg/l, P_b, is the absolute pressure at the depth of air release, lb/in^2, and, O_t, is the percent concentration of oxygen in the air leaving the aeration basin. O_t must be measured experimentally or estimated.

<u>Gas Transfer Rate Coefficient for Clean Water (K_2).</u> For any specific aeration system, the value of K_2 is dependent upon the aeration equipment characteristics, the geometrical configuration of the system, and the operating conditions within the system. In general, K_2 must be experimentally determined in the full scale system if reasonable accuracy is desired.

The effect of temperature on K_2 may be described by (5)

$$K_{2,20^\circ} = \frac{K_{2,T}}{\theta^{(T - 20^\circ)}} \tag{5}$$

in which, $K_{2,20^\circ}$, is the gas transfer rate coefficient for oxygen at 20°C, $K_{2,T}$, is the gas transfer rate coefficient for oxygen at temperature T, and, θ, is the temperature correction coefficient. Tsivoglou (3) has calculated the mean value of θ, from theoretical considerations, to be

$$\theta \text{ mean} = 1.022 \pm 0.004$$

in the temperature range $0^{\circ}C$ to $30^{\circ}C$. This predicted value agrees well with the detailed experimental observations of Churchill et al. giving a value of 1.024 (9). It should be noted that these values of θ were arrived at by considering clean water conditions and should be applied to wastewater conditions with appropriate caution.

The Ratio of C_s for Wastewater to C_s for Clean Water (β). Various pollutants can alter the dissolved oxygen saturation limit. Standard Methods (6) shows the depression of oxygen solubility due to chloride ion concentration. Generally, however, the β factor is not readily predicted and must be determined experimentally.

The Ratio of K_2 for Wastewater to K_2 for Clean Water (α). Various pollutants alter the ability of water to transfer gas molecules. This alteration causes the value of K_2 to vary under identical mixing conditions, depending upon whether clean water or wastewater is being aerated. Eckenfelder (8) indicates that the α factor is not only related to the waste constituents and concentrations but also to the turbulent mixing conditions within the fluid. This means that α determinations must either be conducted in the full-scale system or in a system that duplicates the turbulent mixing within the real system.

The Rate of Dissolved Oxygen Utilization (r). Oxygen utilization is the result of a biochemical process and as such is independent of the physical gas transfer process which is the subject of this thesis. The fact that both of these independent processes influence the same parameter, dissolved oxygen concentration, is a point of confusion for some engineers.

Historical Background

Aeration of Wastewater

The English experimented with the aeration of wastewater as early as 1882(10). The early experiments dealt with aerated filters and diffused air techniques. With the advent of the adtivated sludge process, first introduced by Arden, Edwards, and Lockett(11) in 1914, efforts increased to improve the efficiency of aeration processes. The early diffusers were crude and subject to frequent clogging, therefore mechanical aeration was developed to avoid this problem. In 1920, the Sheffield, England, plant became the first large-scale mechanically aerated wastewater treatment plant (2).

The early mechanical aeration units were not efficient and as a result of this, mechanical aerators were not widely used until the mid-fifties when they "reemerged" to compete with diffused air systems.

Aeration Performance Testing

The large number of variables within any aeration system precludes conventional physical modeling as an evaluation tool. Full-scale testing has developed as the method of aeration performance evaluation. Although numerous variations in technique have been reported, three basic methods are common. Of these methods, the most widely used is the aeration of deoxygenated clean water. Additionally, the steady-state sodium sulfite oxidation and the biological oxygen uptake methods are used.

Aeration of Deoxygenated Clean Water. The unsteady-state application (2) of this method is widely used by equipment manufacturers as the basis for testing their equipment. Before using this method, the aeration tank should be thoroughly cleaned and filled with clean tap water. The dissolved oxygen is removed by stripping with nitrogen gas or by chemical reaction with a stoichiometric excess of sodium sulfite (approximately 800 pounds of dry sodium sulfite per million gallons of test water), aided by a cobalt catalyst. With the aeration system in operation, the dissolved oxygen concentration (C_t) is observed as a function of time and the gas transfer rate coefficient for clean water (K_2) is computed by solving Equation 1 as

$$K_2 = \frac{[\ln (C_s - C_1) - \ln (C_s - C_2)]}{(t_2 - t_1)} \qquad (6)$$

in which, C_1, is the dissolved oxygen concentration at time, t_1, and, C_2, is the dissolved oxygen concentration at time, t_2, both in mg/l. In practice, K_2, is computed as the slope of a semi-log plot of $(C_s - C_t)$ versus time. Near complete mixing is a test requirement.

A steady-state aeration technique has been proposed by McWhirter (13). In this technique, deoxygenated water is continuously fed at a constant flow rate to the aeration tank and aerated water is removed at the same rate. By allowing the system to establish steady-state conditions, the rate of oxygen transfer plus the rate of addition in the influent stream will be equal to the rate of release in the effluent stream. The mass transfer rate coefficient (K_2) for such a system may be calculated from

$$K_2 = \frac{L}{V}\left[\frac{(C - C_i)}{(C_s - C)}\right] \quad (7)$$

in which, L, is the influent and effluent flow rate (ft^3/min) through the aeration system, V, is the volume (ft^3) of the aeration system, C, is the mean dissolved oxygen concentration (mg/l) in the aeration basin and effluent, and, C_i, is the dissolved oxygen concentration (mg/l) in the influent flow.

The assumptions of clean water conditions and complete mixing within the system are also necessary for the use of this test.

Sodium Sulfite Oxidation. In this method, the reaction between sulfite ($SO_3^{=}$) and dissolved oxygen to form sulfate ($SO_4^{=}$) is used to determine the oxygen uptake rate. Cooper, Fernstram, and Miller (14) first applied this method to aeration performance testing. Basically, the test method involves aerating a volume of liquid which has been treated with a large excess of sodium sulfite and a suitable catalyst, either copper or cobalt. The analysis for oxygen transfer is based upon measuring the amount of unreacted sulfite in the water as a function of time. Dissolved oxygen concentration during the test is zero, and near complete mixing is required.

Biological Oxygen Uptake. The performance of aeration equipment can be estimated indirectly by using data obtained from an operating aeration system. Basically, all techniques using this method are based on the method of Streeter and Phelps (5) for estimating natural stream reaeration. This indirect approach consists of calculating the oxygen transfer that must have taken place by attempting to evaluate the effects of all other processes that have modified dissolved oxygen concentrations.

If an aeration system is operating at steady-state, in which dissolved oxygen concentration is being maintained at a constant level ($dC_t/dt = 0$), and the rate of dissolved oxygen utilization, r, is constant, Equation 3 may be solved for the oxygen transfer rate coefficient as

$$\alpha K_2 = \frac{r}{(\beta C_s - C)} \tag{8}$$

in which, C, is the steady-state dissolved oxygen concentration in mg/l.

If the system is not at steady state, an approximation (8, 12) of αK_2 may be obtained by observing the rate at which an aeration system "recovers" after allowing the dissolved oxygen to approach zero as the result of curtailing the aeration. αK_2 can be computed from the slope of a plot of dC_t/dt versus C_t according to the rearrangement of Equation 3.

$$\frac{dC_t}{dt} = (\alpha K_2 \beta C_s - r) - \alpha K_2 C_t \tag{9}$$

assuming $(\alpha K_2 \beta C_s - r)$ will be constant for the specific operating condition.

Standard Conditions. There appears to be general agreement (12) on a set of "standard" conditions to which data on aeration performance may be adjusted for comparison. These standard conditions of clean tap water at 20°C, zero dissolved oxygen, and saturation (C_s) at 20°C may be used to establish the pounds of oxygen dissolved per unit time if the basin contents were at standard conditions. The expression for computing oxygen transfer capacity in a mechanical surface aeration system is

$$N_s = \frac{(K_{2,20^\circ})\ (C_s)\ (W)}{10^6} \tag{10}$$

and for a diffused air system is

$$N_s = \frac{(K_{2,20^\circ})\ (C_{sm})\ (W)}{10^6} \tag{11}$$

in which, N_s, is the pounds of oxygen dissolved per unit time at standard conditions, $K_{2,20^\circ}$, is the gas transfer rate coefficient adjusted to 20°C by Equation 5; C_s, is the saturation limit, previously discussed; C_{sm}, is the saturation limit for a diffused air system as computed from Equation 4, both in mg/l; and, W, is the weight of water in the test system, in pounds. (The 10^6 factor is a unit conversion term.)

The efficiency of the aeration equipment can be determined by dividing the pounds of oxygen dissolved per hour under standard conditions (N_S) by the power input to the aeration equipment being tested. Much of the available literature, however, rates diffused air systems in terms of the weight of oxygen absorbed by the liquid in percent of that supplied to the system.

Critique of Testing Methods. The most widely used method, aeration of deoxygenated clean water, has the major disadvantages of being a clean water only test and requires conditions of near complete mixing if valid results are to be obtained. The clean water requirement precludes the field testing of waste treatment systems under process conditions. Also, as complete mixing is not a necessary requirement in many treatment plants, numerous installations which are quite satisfactory in treatment terms are not suitable for aeration performance evaluation by the clean water aeration method.

The sulfite oxidation method involves simultaneous diffusion and chemical reaction as a measure of physical gas transfer. The sulfite oxidation method has been reported to give results significantly different than those associated with direct gas transfer measurements due to sensitivity of the chemical reaction to trace quantities of certain catalysts and inhibitors (13). The method is not widely used for rating aeration performance due to these problems.

The biological oxygen uptake method can at best give relative performance information rather than absolute performance. Novak (15) reports that "oxygenating efficiencies of aerators measured during steady-state operation are not accurate enough to determine compliance with performance guarantee." The difficulty with the biological method is that the calculated oxygen transfer capacity will be based on a theoretical model involving biological parameters that are at best difficult to evaluate and usually impossible to verify.

Until now, no satisfactory testing method has been available for accurate measurement of oxygen transfer capacity under process conditions in operating waste treatment systems.

CHAPTER III

FIELD TRACER MEASUREMENT OF AERATION PERFORMANCE

General Description of the Tracer Method

The field tracer method described here was originally developed by Tsivoglou (1) for the measurement of stream reaeration capacity. The first application to streams was in several reaches of the Little Miami River near Cincinnati, Ohio, in the spring and early summer of 1966.

The tracer method depends upon the simultaneous use of three tracers, a fluorescent dye, a dispersion tracer (tritiated water molecules), and a gaseous tracer (krypton-85). The fluorescent dye indicates the presence of the two invisible radioactive tracers. The tritiated water provides an accurate measure of dispersion of the tracer dose: the concentration of tritium changes with time because the tracer is dispersed as the result of turbulent mixing and dilution by influent flow to the system, and since the tritium is in the form of water molecules, it is not significantly adsorbed on the biological floc or basin walls. (The fluorescent dye is subject to adsorptive losses and may not adequately measure dispersion). The dissolved gaseous tracer (krypton-85) is subject to the same dispersion as the dye and tritium since all three tracers are released simultaneously as a homogeneous mixture; additionally it is lost to the atmosphere due to physical gas transfer, but, being a noble gas, krypton-85 is not subject to other losses of any significance.

Krypton-85 transfer in water can be described by an appropriate modification of the basic oxygen transfer expression, Equation 2. The concentration of krypton-85 present in the earth's atmosphere can be taken to be zero, for practical purposes. Therefore, any dissolved krypton-85 in a water system will be steadily lost from the water to the atmosphere according to the expression

$$\frac{dC_{kr,t}}{dt} = -K_{kr}(C_{kr,t}) \tag{12}$$

in which $C_{kr,t}$ is the concentration of dissolved krypton-85 in the water at time, t, and, K_{kr}, is the gas transfer rate coefficient for krypton-85.

It has been shown (3, 16), both experimentally and theoretically, that for the same conditions of turbulence

$$\frac{K_{kr}}{K_2} = 0.83 \pm 0.04 \tag{13}$$

and this is the basis for using krypton-85 as a tracer for oxygen in aeration studies. It is important to note that the numerical constant, 0.83, in Equation 13 has been demonstrated to be independent of the degree of turbulent mixing, independent of the directions in which the two gases happen to be moving, and independent of temperature within the range 10 to 30^{o}C (3, 16). Additionally, Gordon and Etzel (17) have independently verified the ratio in Equation 13 with a series of pilot scale laboratory experiments in a biologically active wastewater using krypton-85 (no dispersion tracer was used) as an indicator of mass transfer. The tracers have also been used to measure, α, factors for polluted waters in a series of experiments by the writer (18). While various pollutants can alter the ability of water to transfer gas molecules, the ratio of the gas transfer rate coefficient for krypton-85 to that for oxygen (Equation 13) is independent of pollutants present in the water. Therefore, in order to be consistent with previous notation, Equation 13 may be rewritten as

$$\frac{\alpha K_{kr}}{\alpha K_2} = 0.83 \pm 0.04 \qquad (14)$$

where, α, is the ratio of the gas transfer rate coefficient for wastewater to that for clean water, K_2, is the oxygen transfer rate coefficient for clean water and, K_{kr}, is the krypton-85 transfer rate coefficient for clean water. The values of αK_{kr} and αK_2 in Equation 14 represent the real gas transfer coefficients for actual conditions, that is, in the presence of whatever pollutants.

Experimental Basis

Consider an aeration basin into which a single homogeneous solution containing the three tracers previously discussed is released at a point. By sampling at a fixed point within the basin, as a function of time, the concentration ratio of krypton-85 relative to tritium can be established for each sampling time such that

$$R_t = \frac{C_{kr,t}}{C_{H,t}} \tag{15}$$

where $C_{kr,t}$ and $C_{H,t}$ represent the concentration of krypton-85 and tritium in a single sample taken at time, t, and R_t is the concentration ratio of the tracers. By applying this ratio concept, Equation 12 may be modified to

$$\frac{dR_t}{dt} = -\alpha K_{kr} R_t \tag{16}$$

with terms as previously defined. Solving Equation 16 and rearranging terms we obtain

$$\alpha K_{kr} = \frac{\ln (R_2/R_1)}{-(t_2 - t_1)} \tag{17}$$

in which, R_1 and R_2 represent the krypton-85 to tritium concentration ratios at time, t_1, and, t_2, respectively. Thus, the use of tritium provides an accurate correction for the effects of dispersion. The tracers can evaluate the actual krypton-85 transfer coefficient (αK_{kr}) for any aeration system and the conversion to an actual oxygen transfer coefficient (αK_2) can then be made using Equation 14.

It should be noted that the tracer method does not rely on any theoretical assumptions that cannot be verified. The tracer method is a direct measurement of gas transfer under real conditions of mixing, water quality (biological and chemical), flow, temperature, weather, etc.

Field and Laboratory Procedures

Dose Preparation

The tracers utilized in the studies reported here were obtained as one mixed tracer unit consisting of approximately 10 curies of tritiated water and 2 curies of krypton-85 with both isotopes being contained in 9 liters of Rhodamine water tracing fluorescent dye.

It was decided to utilize this 9-liter unit, in the aeration performance evaluation studies reported here, by making several smaller tracer doses from the single 9-liter unit. In all, 28 smaller units were obtained: sixteen 500 ml units, each containing approximately 270 millicuries of tritiated water and 54 millicuries of krypton-85; and twelve 500 ml units, each containing approximately 470 millicuries of tritiated water and 94 millicuries of krypton-85.

Each of the 28 tracer doses was prepared by slowly pumping mixed tracer from the 9-liter unit and discharging it under a layer of distilled water previously placed in the bottom of a 500 ml glass bottle. When the desired volume of mixed tracer had been transferred into a particular unit, pumping was stopped and the discharge tube was removed from the 500 ml bottle. The remaining volume in the bottle was then slowly filled with distilled water to a level at which a pressure type screw cap could be used to seal the bottle with no air space inside. A strip of plastic tape was then wrapped around the neck of the bottle to seal the cap to the bottle neck. Each 500 ml tracer unit was placed in a one-quart metal can, surrounded with vermiculite, sealed in a canning machine, and stored upside down until ready for use.

Radiation Safety. As both tritium and krypton-85 are radioactive materials covered under the rules and regulations of the U. S. Atomic Energy Commission, a license was required to possess and use these tracers. All licensing details, for these studies, were handled by the Office of Radiological Safety, Georgia Institute of Technology.

Tritium is a hydrogen isotope having one proton and two neutrons in the necleus. Tritium decays by beta emission only and has a radioactive half life of 12.3 years. The tritium beta emission is weak (0.018 Mev) and is readily absorbed in the tracer solution itself and the walls of the tracer container, so that no detectable personnel radiation dose resulted from tritium.

Krypton-85 decays by both beta and gamma radiation with a radioactive half life of 10.3 years. The beta emission, more energetic (0.69 Mev) than that of tritium, and the penetrating gamma radiation are potential radiation hazards to individuals handling krypton-85. Therefore, measures were taken to minimize the radiation dose received by individuals handling this radioisotope.

All personnel involved in the dose preparation or field release of the tracers wore beta/gamma film badges for purposes of measuring any radiation dose actually received. In addition, all phases of the dose preparation and all field releases were monitored with a radiation survey meter connected to a loudspeaker as a warning device. Radiation exposures were minimized during the dose preparation operation by the use of lead and concrete shielding.

Field release procedures were designed to minimize the required handling of the tracers (no more than five minutes per release).

Due to these and other precautions, the radiation dose received by any individual did not approach the daily limit that is allowed for continuous occupational exposure over a lifetime. In fact, only one film badge record (associated with the dose preparation) was even above the minimum level of detection.

Tracer concentrations were greatly reduced by dilution and dispersion within the confines of each waste treatment plant at which the tracer tests were conducted. At the point of discharge to the receiving stream, tracer concentrations were below the maximum permissible concentrations for continuous lifetime exposure of an individual member of the public. As the public is excluded from wastewater treatment plants, no potential public exposure was involved there. No significant public use of the receiving streams to which the tracers were released occurred for many miles below the discharge points.

Future applications of the tracer method in systems larger than those reported here need not result in any additional public exposure potential, as the actual basin concentrations do not need to be larger than those reported here. However, additional precautions might prove desirable for the protection of personnel handling the larger tracer doses.

Field Procedures

All field studies were conducted in essentially the same manner, except that dose release and sampling station locations were different for each basin studied. After examining structural plans, a site visit was made to each plant for the purpose of determining the best dose release and sampling stations.

Dose Release. A previously prepared tracer dose was transported to the field test site by vehicle. During transit, a combination of shielding and distance was effective in minimizing radiation exposure to personnel in the vehicle carrying the tracer dose. In addition, a radiation survey meter connected to a loudspeaker provided continuous monitoring in the vehicle during transit. At the field site, the tracer dose was set aside, still in its sealed metal can, until all other equipment was unloaded and readied. Immediately before opening the metal can, each tracer dose (with the exception of dose 6/25/71) was mixed by several inversions of the metal dose can, to assure uniform concentration of the tracers in the bottle. The dose was carried to the release point where the metal can was opened with a kitchen can opener while a radiation survey meter monitored for any krypton-85 gas leaks (none were ever observed). The dose bottle was removed from the can and taped to the end of a metal rod about 10 feet long. An electrical dynamite cap (explosives license required) was taped to the bottle just before the bottle was positioned about three feet below the water surface by means of the metal rod. The electircal leads of the blasting cap remained in the factory shield until the dose and attached blasting cap were under the water surface. A six-volt dry cell battery was used to detonate the blasting cap, which shattered the bottle and thereby released the tracer dose in the aeration basin. The exact time of release was recorded and the dose release operation was complete.

The blasting cap did not create a splash in the basin. In fact, the moment of release would have been difficult to detect if it were not for the report of the dynamite cap. Earlier tests of this dose release technique indicated that the dose bottle was shattered into pea-sized fragments, thereby giving an instantaneous dose release, for all practical purposes.

Field Sampling. All aeration basin sampling stations were readied before the dose release, with background samples taken just before release. The first tracer studies were sampled by placing a submersible pump at a fixed depth and delivering the pump flow through garden hose to a continuous flow, recording fluorometer located at the edge of the basin. After passing through the fluorometer, the flow was split with most going to waste and a small flow (400 to 600 ml per minute) being delivered to the bottom of a glass one-ounce sampling bottle via transparent flexible plastic tubing. The flow into this bottle was allowed to spill over the top until a sample was wanted. Each bottle was identified with a sample number and fitted with a pressure type screw cap that excluded any air space from the bottle.

After successfully conducting the first few studies with the fluorometer arrangement described above, it was decided that the fluorescent dye concentration-time curves were not necessary; instead, discrete radiotracer samples were taken at frequent intervals and the associated tritium concentration data was sufficiently accurate to provide all necessary information. Hand sampling devices were also constructed to eliminate the necessity of using the submersible pumps. The hand samplers were designed on the same principle as the ordinary dissolved oxygen sampler described in Standard Methods (6). Before abandoning the fluorometer and pump arrangement, both methods were used to sample the same study. It was determined that the hand sampling technique gave results consistent with those of the earlier technique while saving considerable time and effort.

Generally, sampling was begun within two to five minutes of the dose release and continued on a fairly regular basis (five minute interval) for about one hour. The time and identification number of each sample were recorded in the field notes. Each field sample was pressure capped immediately, sealed with plastic tape, and stored upside down in a wooden box for transport to the laboratory. Basin water temperature was also recorded, together with any other operating variables such as waste flow, sludge recycle, etc., that might prove to be of interest.

<u>Laboratory Procedures</u>

The method of sample analysis used for the studies reported here is the same as that used by Tsivoglou (3). The procedures are fully developed and the details have been reported elsewhere (19).

The method involves simultaneous counting of krypton-85 and tritium in replicate two-ml portions, using a three-channel Packard TriCarb liquid scintillation counter. The particular counter used was equipped with an automatic sample changer and an automatic external standard (AES) radiation source that provided a common basis for establishing the counting efficiency of each sample analyzed. The counter was also equipped with an automatic data printout system so that once the counter was loaded with samples, operation was fully automatic.

Tritium has only a weak beta emission, while the beta emission from krypton-85 is considerably greater, hence the scintillation counter channel limits were set such that all tritium counts were recorded in the lowest energy channel (tritium channel) and krypton-85 counts were primarily recorded in the higher energy channel (krypton-85 channel). The counting efficiency of samples varied due to differences in quenching (caused by sample impurities and sample volume differences), variations in counter electronics, counting vial variations, etc. The automatic external standard (AES) was counted after each sample and could be correlated to the counting efficiency of each radioisotope by means of calibration curves previously prepared. Some high energy krypton-85 counts were spilled over into the lower energy tritium channel due to the previously mentioned quenching effect. The percent spillover was also related to the AES count by means of a calibration curve. The calibration curves used for all samples analyzed are shown in Figure 1.

Sample preparation techniques (19) were designed to minimize the possibility of cross-contamination of samples or loss of dissolved krypton-85 gas during transfer procedures. Preparation of the individual samples for counting consisted of transferring a two-ml aliquot from the one-ounce field sample bottle to a special 25-ml counting vial that had been previously filled with 10 to 15 ml of Butler's solution containing the liquid scintillator. After the transfer was complete, the vial was then filled full with Butler's solution, capped, and loaded into the counter. For each field sample analyzed, two replicate two-ml portions were prepared for counting. Each of these replicate samples was subsequently counted for five or ten minutes, depending on specific activity. Three different counts were conducted on each sample, with the exception of study 8/4/71 samples which were counted twice. Thus, for every field sample, a minimum of four separate counts was available. Using this technique, excellent counting statistics were obtained for samples with count rates as low as 50 percent above the background count rate.

Typical counting efficiencies (Figure 1) obtained were about 28 percent for tritium and about 89 percent for krypton-85. It is important to remember that the tracer method does not rely on knowing absolute counting efficiencies, although they were obtained for these studies. Only relative counting efficiencies are required, as the ratio of the two radioisotope concentrations is the item of interest.

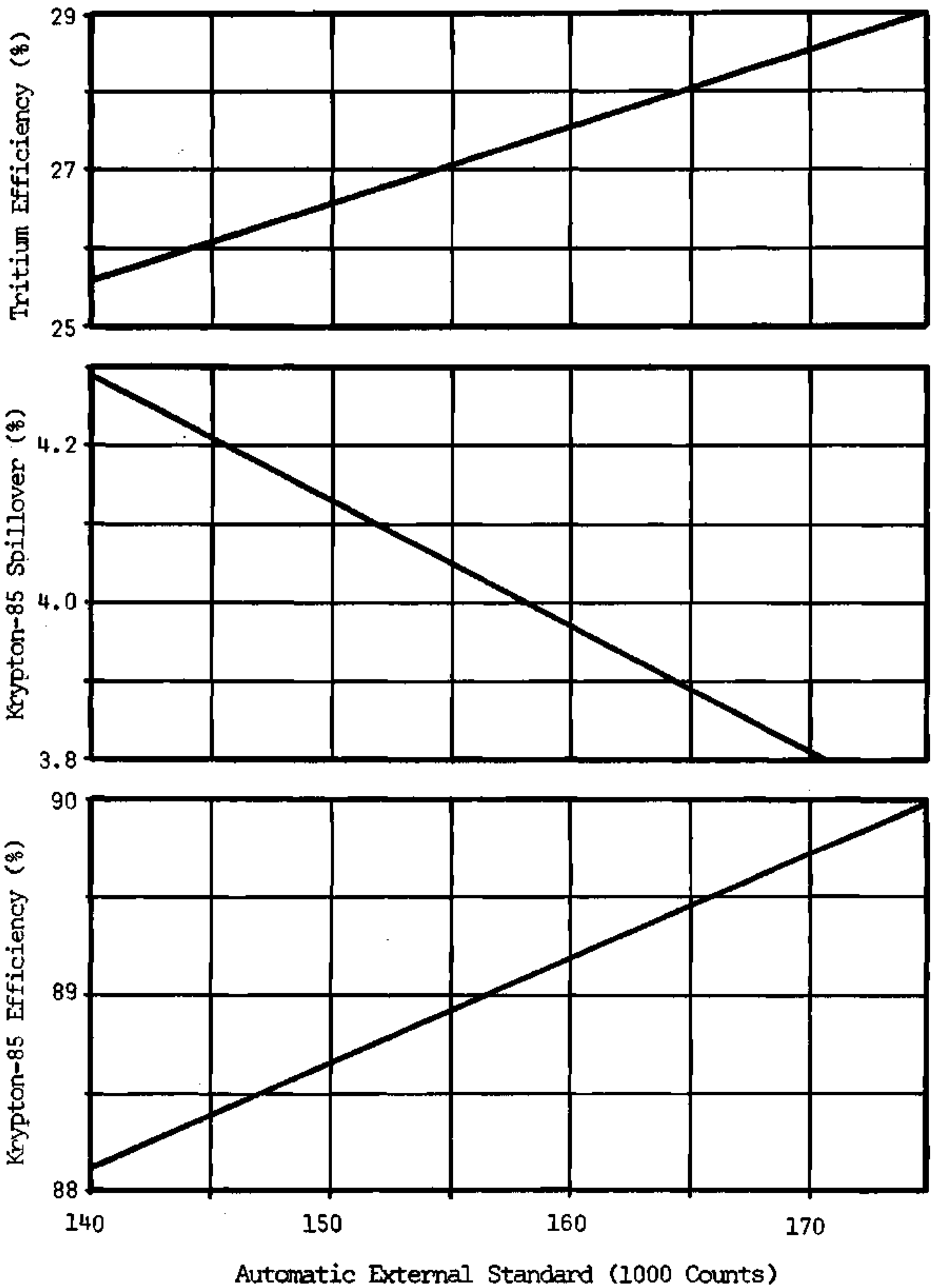

Figure 1. Liquid Scintillation Counter Calibration Curves

Analysis of Counting Data

Typical counting data, taken from the results of the South Cobb Plant Study of 7/15/71, will be used here as an example of the method of data analysis.

All raw counting data are included in Table 1, with all tests reported in chronological order. For the study of 7/15/71 (Table 1, pp 60 - 62) three sampling locations were used (A, B, and D) and samples from each station were identified with a station letter and a sample number. When each field sample was prepared for counting, the replicate portions were further identified with a letter. For the South Cobb Plant Study of 7/15/71, the third sample taken at Station B (Table 1, p 61) was identified as sample B03, when sample B03 was prepared for scintillation counting, the two replicates were identified as B03 A and B03 B.

From the study of 7/15/71, the observed raw background counts in the tritium channel ranged from 159 to 210 with an average of 183; the observed raw background counts in the krypton channel ranged from 373 to 477 with an average of 423. (All background samples were identified with the letter B following the station identification, such as AB1 or BB2). For sample B03, both replicates (B03A and B03B) were counted three times each for ten minutes (Table 1, p 61). The net tritium channel count for sample B02A was (4089 - 183) = 3906 counts, and the net observed krypton-85 channel count was (1481 - 423) = 1058 counts as shown in Table 2, p 87. The calibration curves (Figure 1) indicated that 41 krypton-85 counts had spilled over into the tritium channel, therefore the actual net krypton-85 count was 1099 and the actual net tritium count was 3865 (Table 2 shows 3864 due to round off). The calibration curves also indicated tritium and krypton-85 counting efficiencies of 28.1 and 89.5 percent respectively based on the average observed AES count. The average krypton-85 to tritium concentration ratio for sample B03A was therefore

$$\frac{(1099/0.895)}{(3865/0.281)} = 0.0893$$

(All ratio computations are included in Table 2, pp 77 - 102).

<u>Calculation of Actual Gas Transfer Rate Coefficients (αK_{kr} and αK_2)</u>

It was decided that counting data with count rates 50 percent or greater than background count rates could be used to compute the actual krypton-85 transfer rate coefficients (αK_{kr}). Table 3 (pp 103-111) contains all required information for computing αK_{kr} for each station sampled. The data meeting the 50 percent above background criterion are enclosed in brackets on each station's result shown in Table 3. For each station, the krypton-85 to tritium concentration ratios were plotted as a logarithmic function of time from which the line of "best fit" was then obtained by the method of least squares. The slope of this best fit line was reported as the αK_{kr} for the particular station. The αK_{kr} was converted to an αK_2 by means of Equation 14. Since a basis for comparing the various studies was desired, the pounds of oxygen per unit time that would have been dissolved if the aeration basin contents were at 20°C and zero dissolved oxygen was computed for each study. For the mechanical aeration studies, the expression used for computing the transfer was

$$N_a = \frac{(\alpha K_{2,20^o})\ (\beta C_s)\ (W)}{10^6} \tag{18}$$

and for the diffused aeration studies the expression was

$$N_a = \frac{(\alpha K_{2,20^o})\ (\beta C_{sm})\ (W)}{10^6} \tag{19}$$

where, N_a, is the pounds of oxygen per unit time with all other terms as previously defined.

Kenwood Plant Studies

The Kenwood sewage treatment plant is a 70,000 gpd extended aeration unit. The aeration basin has a volume of 70,000 gallons with one 7.5 hp Lightnin mechanical surface aerator. The plant treats domestic waste only. Since the aeration tank is designed for a near complete mix, two sampling stations were considered sufficient. Figure 2 shows the location of each sampling station and the dose release point used for each of the three studies conducted in the basin. Each study in this basin used one of the small tracer units containing approximately 270 millicuries of tritiated water and 54 millicuries of krypton-85. The three studies in this system were conducted over a three-week period. The first tracer release (6/25/71) in the basin deviated from the previously described procedures in that the tracer dose was not

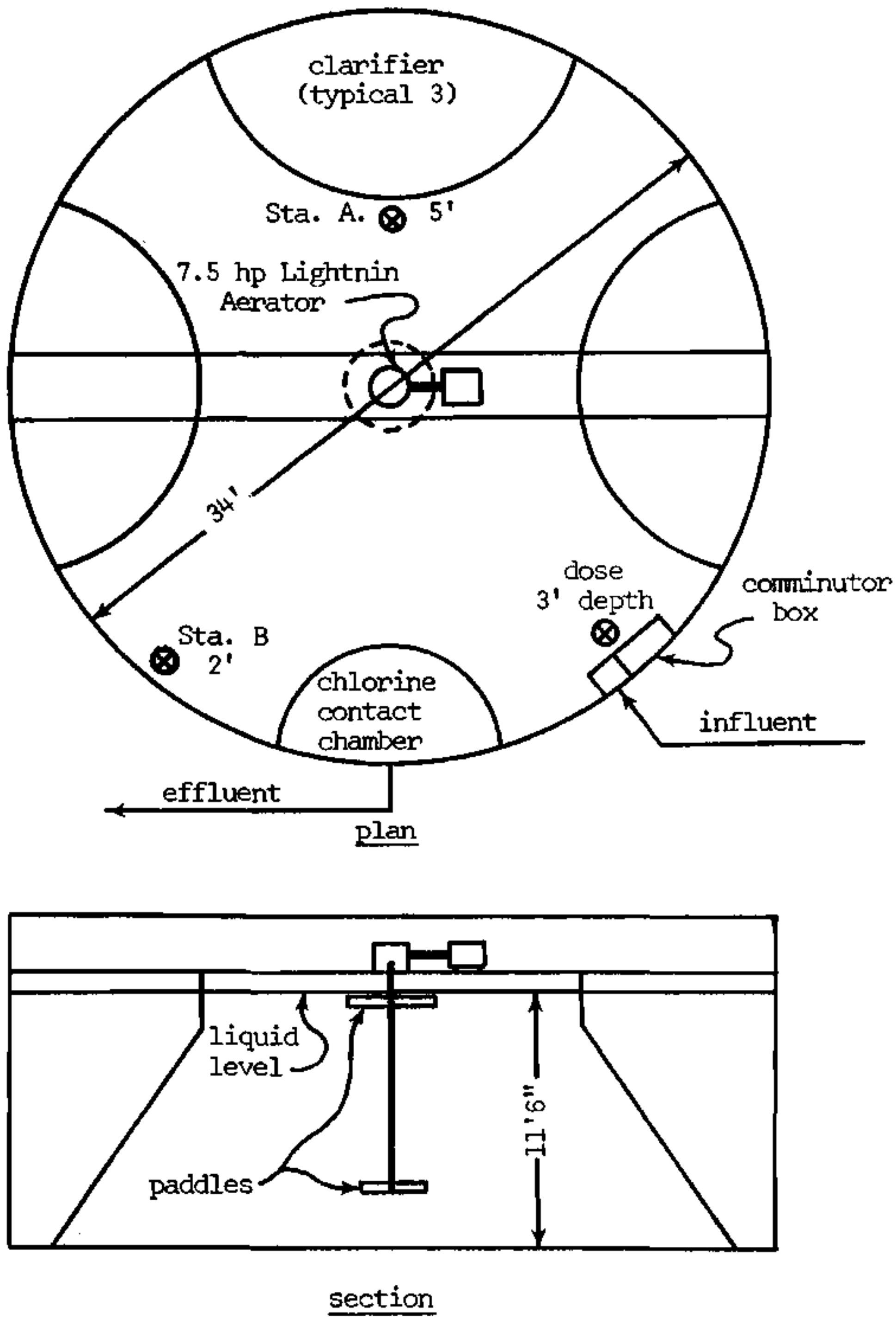

Figure 2. Sampling Locations, Kenwood Plant

well mixed before the dose release. The implications of this deviation will be discussed later.

South Cobb Plant Studies

After the successful completion of the studies at the Kenwood Plant, the South Cobb sewage treatment plant was selected as a test site. This plant has one mechanically aerated activated sludge basin with a design treatment capacity of two mdg. The aeration tank has a volume of 502,000 gallons with four 10 hp Yeomans Hi Cone mechanical surface aerators. The South Cobb Plant treats a combination of domestic and industrial waste. As this basin is quite large, several sampling stations were used. Figure 3 shows the location of each sampling station. The dosing location was the same for each of the three studies conducted in this basin. Each tracer dose released in the basin contained approximately 470 millicuries of tritiated water and 94 millicuries of krypton-85.

South River Plant Studies

The South River sewage treatment plant has four parallel activated sludge basins equipped with diffused air aeration. Each basin has a volume of 476,000 gallons and a design treatment capacity of 3 mgd. The air blowers provide approximately 2.1 million standard cubic feet of air per day to each of the four units. Two of the basins use Walker Process "Duosparj" and "Monosparj" diffusers while the other two basins use Water Pollution Control Corp. "Sanitaire" diffusers. Two tracer studies were conducted in the South River Plant;

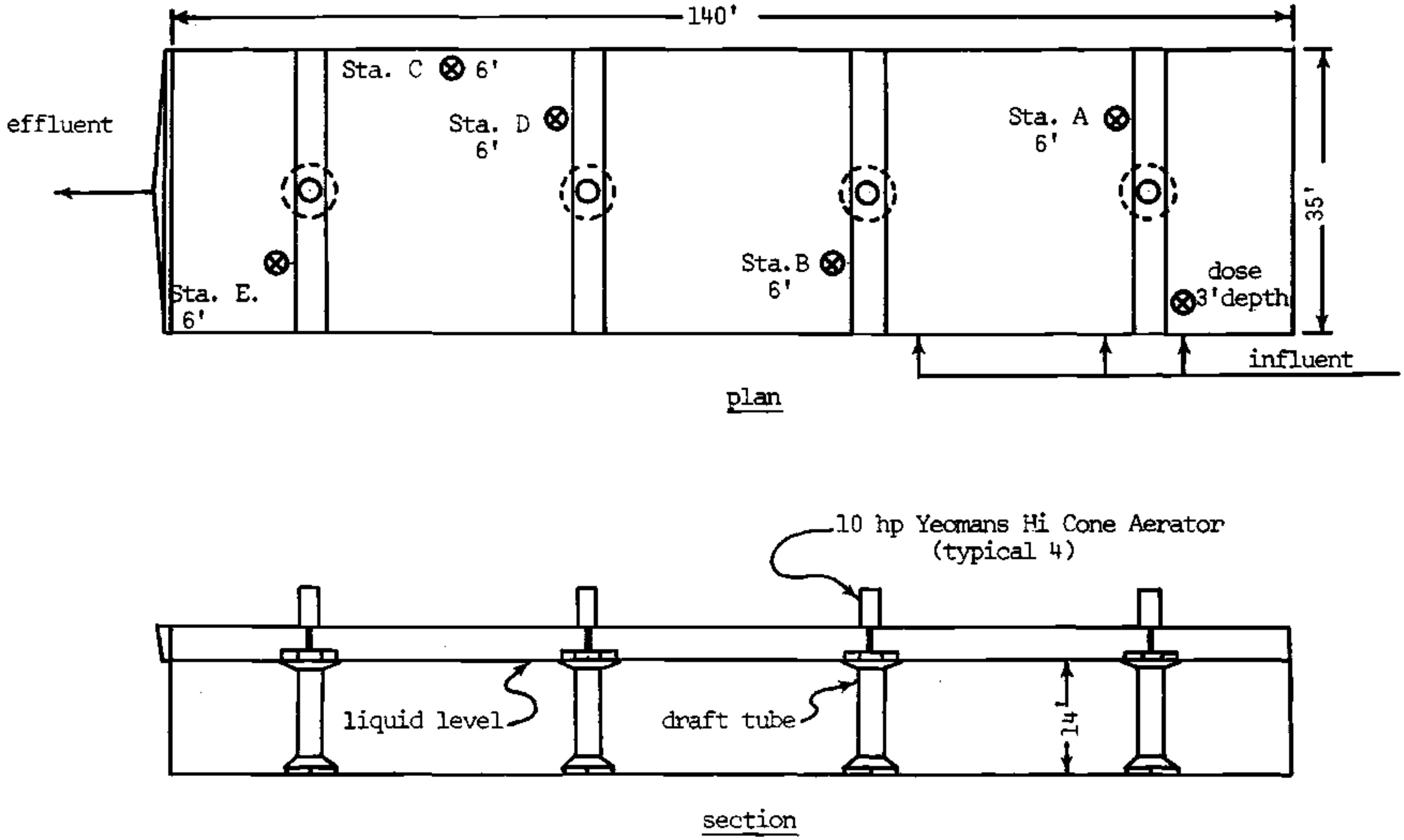

Figure 3. Sampling Locations, South Cobb Plant

the first (8/16/71) was conducted in one of the Walker Process units; the second (8/24/71) was conducted in one of the Water Pollution Control Corp. units. Figure 4 shows the sampling and dosing locations for both studies. Each of the two tracer doses released in the basins contained approximately 470 millicuries of tritiated water and 94 millicuries of krypton-85

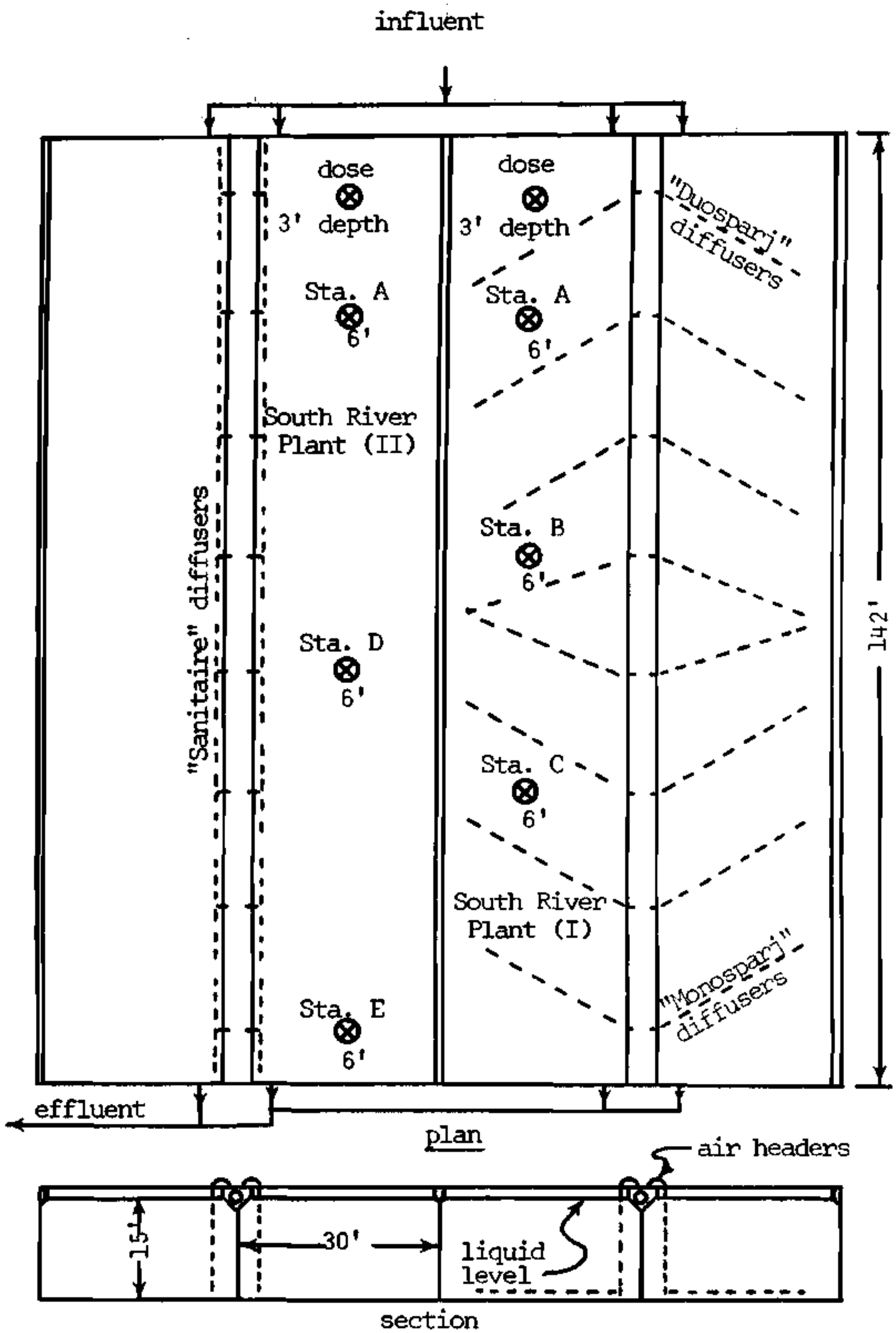

Figure 4. Sampling Locations, South River Plant

CHAPTER IV

PRESENTATION AND DISCUSSION OF TEST RESULTS

The purpose of the tests reported here was to fully demonstrate and verify the krypton tracer method as a general procedure for testing aeration performance under process conditions. Eight separate tracer studies were performed producing the raw counting data in Table 1 (pp 51-76). Krypton-to-tritium concentration ratios were computed from the raw data, as previously discussed, and all ratio computations are shown in Table 2 (pp 77-102). The tritium data reflect dispersion, and are summarized with the ratio data in Table 3 (pp 103-111). Figure 5 is a typical plot of both the tritium concentrations and krypton-to-tritium concentration ratios from a test at the South Cobb plant. Table 4 summarizes all observed krypton-85 transfer rate coefficients and the associated oxygen transfer capacities adjusted to 20^{o}C using a value of 1.022 for θ.

As previously mentioned, the first tracer study (6/25/71) deviated from the dosing procedure used for all subsequent studies in that no attempt was made to thoroughly mix the dose before release. Figures 6a and 6b compare study 6/25/71 with another typical study in the Kenwood Plant. Both sampling stations (A and B) of the 6/25/71 study show somewhat erratic concentration ratios during the first few minutes after the release. The only known difference associated with

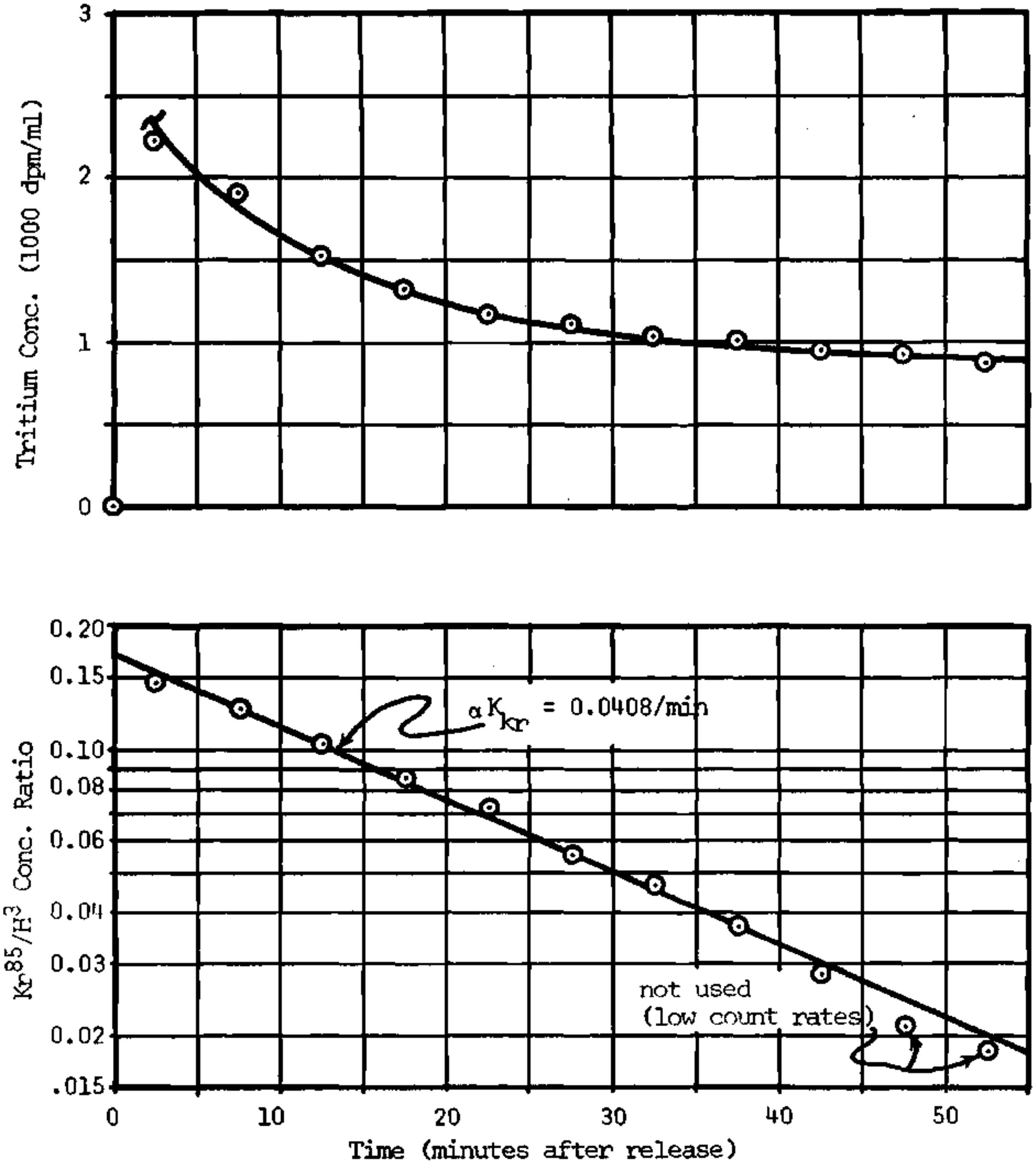

Figure 5. Plot of Typical Test Results, South Cobb Plant (8/4/71)
Station A

Table 4. Summary of Field Test Results

Plant	Test	Station	αK_{Lr} (1/min)	Temp. (°C)	$\alpha K_{2,20°}$* (1/min)	N_a/β** (lb O_2/hr)
Kenwood	6/25/71	A	0.0368	25	0.0398	12.8
		B	0.0380	25	0.0410	13.2
	7/2/71	A	0.0386	23	0.0436	14.1
		B	0.0393	23	0.0444	14.3
	7/9/71	A	0.0417	23	0.0471	15.2
		B	0.0412	23	0.0465	15.0
South Cobb	7/15/71	A	0.0419	24	0.0463	107
		B	0.0438	24	0.0484	112
		C	0.0485	24	0.0536	124
	7/22/71	A	0.0501	24	0.0553	128
		B	0.0456	24	0.0504	117
		D	0.0461	24	0.0509	118
		E	0.0433	24	0.0478	111
	8/4/71	A	0.0408	24	0.0451	104
		B	0.0405	24	0.0441	103
		D	0.0457	24	0.0505	117
		E	0.0460	24	0.0508	117
South River (I)	8/16/71	A	0.0248	25	0.0268	70.3
		B	0.0244	25	0.0264	69.2
		C	0.0228	25	0.0246	64.5
South River (II)	8/24/71	A	0.0228	25	0.0246	64.5
		D	0.0231	25	0.0250	65.5
		E	0.0228	25	0.0246	64.5

* $\theta = 1.022$

** $C_s = 9.2$ or Csm = 11.0 mg/l

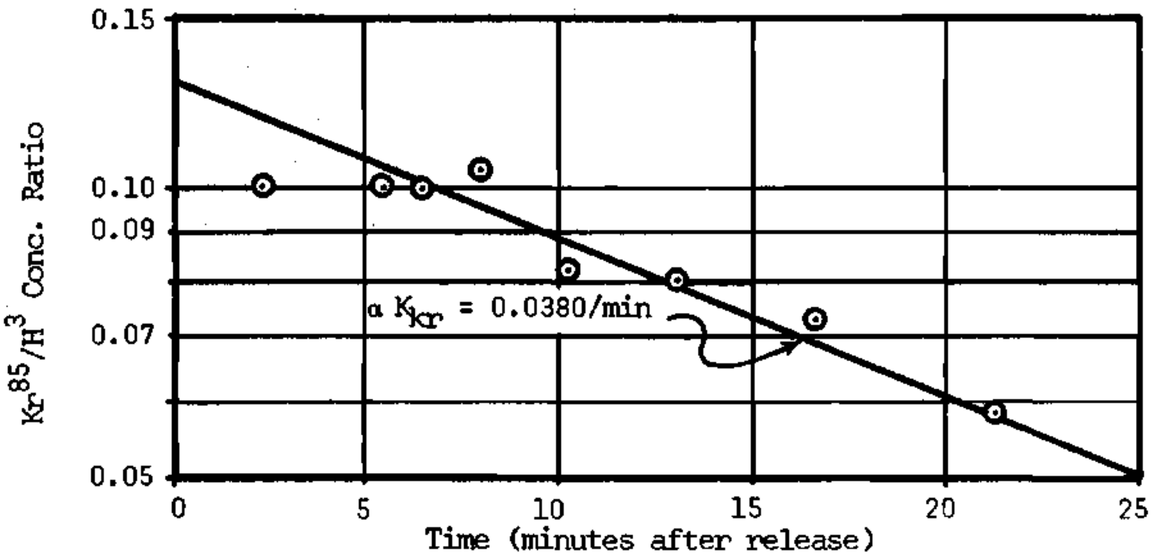

Figure 6a. Plot of Initial Results From Kenwood Test (6/25/71) Using Nonhomogeneous Tracer Dose

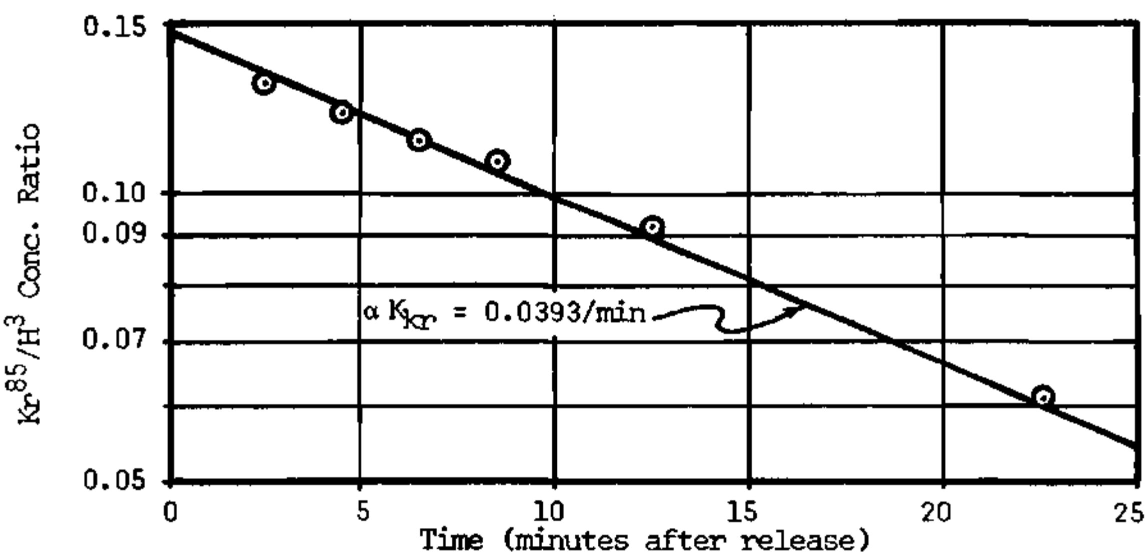

Figure 6b. Plot of Initial Results From Kenwood Test (7/2/71) Using Homogeneous Tracer Doses

test 6/25/71 was the lack of dose mixing prior to release, and as the other studies (in which the dose was well mixed) did not show such inconsistancy, it was concluded that the first few samples of study 6/25/71 should not be used in the computation of the gas transfer rate coefficient. However, the Kenwood plant is based on complete mix design criteria, and hence samples taken after homogeneous tritium concentrations were established in the basin were used to compute K_{kr} for test 6/25/71.

In order to demonstrate the applicability of the tracer method under a wide variety of operating conditions, data were obtained concerning the hydraulic, chemical, and biological characteristics during several studies. All such operational data collected are included in Table 5 (pp 112-113).

A total of 23 observations of gas transfer capacity were made during the eight studies. For each plot of the krypton-to-tritium concentration ratio versus time (as shown in Figure 5), the αK_{kr} was obtained by the method of least squares. The goodness of fit was determined for each plot and reported as the linear correlation coefficient. The poorest correlation coefficient obtained was -0.992 with the average being -0.998. The correlation coefficient for each station sampled is shown in Table 3 (pp 103-111).

The average $\alpha K_{2,20^{\circ}}$ obtained from six observations at the Kenwood plant was 0.0437/min, the range being from 0.0398/min to 0.0471/min. The differences in mixed liquor characteristics (Table 5, p 112) among the three Kenwood Plant studies suggest strongly that the differences among the three separate observed gas transfer coefficients (αK_{kr} and αK_2) were primarily the result of different pollutant effects (α) rather than different hydrodynamic conditions.

The average $\alpha K_{2,20^\circ}$ obtained from 11 observations at the South Cobb plant was 0.0498/min, with a range of 0.0447/min to 0.0553/min. In this case, it is difficult to determine if variations in $\alpha K_{2,20^\circ}$ resulted from differences in waste characteristics or hydrodynamic conditions. However, the precision of each observed $\alpha K_{2,20^\circ}$ indicates that the variations were real and not primarily associated with experimental error.

The two South River plant studies were conducted in geometrically identical basins with each having a different brand of diffusers installed. Both the Walker Process basin, designated as South River Plant (I), and the Water Pollution Control Corp. basin, designated as South River Plant (II), employ tapered aeration in that more air is delivered to the influent end diffusers than to those near the effluent end of the basin.

The test results from both basins show no real change in $\alpha K_{2,20^\circ}$ along the length of either basin. The average $\alpha K_{2,20^\circ}$ for the Walker Process basin was 0.0259/min, with a range of 0.0246/min to 0.0268/min. The average $\alpha K_{2,20^\circ}$ for the Water Pollution Control Corp. basin was 0.0247/min, with a range of 0.0246/min to 0.0250/min. The tracer demonstration having been completed, these South River Plant tests were not carried further.

Although it was not the purpose of this thesis to determine the oxygen transfer efficiency of any particular aeration device, efficiencies were computed for each test facility. The mechanical aerator (Kenwood and South Cobb Plants) efficiencies were computed by dividing the, N_a, value (Table 4) by the total nameplate horsepower of the aerator(s) in the basin. For example, the South Cobb Plant studies gave an average N_a/β of 114 lbs O_2/hr (Table 4), and as the basin has four 10-hp units, the average transfer efficiency was

$$\frac{114(\beta)}{40} = 2.9(\beta) \text{ lbs } O_2/\text{hp-hr}$$

The average transfer efficiency in the Kenwood Plant was found similarly to be 1.9(β) lbs O_2/hp-hr.

For the diffused air studies (South River I & II), efficiencies were computed by dividing the, N_a, value by the rate at which oxygen was supplied to the basin by the blowers. In computing the, N_a, value for the diffused air studies, a C_{sm} was calculated from Equation 4. The absolute pressure at the depth of air release (P_b) was calculated as 21.0 psia. The percent concentration of oxygen in the air leaving the aeration basin (O_t) was calculated by assuming five percent transfer from the rising air bubbles. Assuming 21 percent oxygen in the atmosphere, O_t, was calculated as

$$O_t = \left(\frac{19.95}{19.95 + 79}\right) X \;\; 100 \;\; = \;\; 20.2\% \; O_2$$

therefore, from Equation 4 at 20°C

$$C_{sm} = (9.2)\left(\frac{21.0}{14.7} + \frac{20.2}{21}\right) \frac{1}{2} = 11.0 \text{ mg/l } O_2$$

The oxygen transfer efficiencies for the South River Plant studies were calculated from

$$e_d = \frac{(\text{lb } O_2 \text{ absorbed/hr})}{(\text{lb } O_2 \text{ supplied/hr})} \times 100 \qquad (20)$$

where, e_d, is the percent oxygen transfer efficiency for the diffused air system. The rate of oxygen absorption is simply the, N_a, value as computed from Equation 19 using a C_{sm} value of 11 mg/l. The oxygen supply rate was computed as

$$\text{lb } O_2 \text{ supplied/hr} = \left[\frac{2.1 \times 10^6 \text{ std.ft}^3}{\text{day}}\right]\left[\frac{\text{day}}{24 \text{ hr}}\right]\left[\frac{0.232 \text{ lb } O_2}{\text{lb air}}\right]\left[\frac{0.0808 \text{ lb air}}{\text{std ft}^3}\right]$$

$$= 1640 \text{ lb } O_2/\text{hr}$$

The average N_a/β value (Table 4) for the South River I (Walker Process diffusers) test was 68 pounds of oxygen absorbed per hour, therefore the transfer efficiency was

$$e_d = \frac{68.0(\beta)}{1640} \times 100 = 4.1\%(\beta)$$

for the South River II (Water Pollution Control diffusers) test the transfer efficiency was

$$e_d = \frac{64.8(\beta)}{1640} X\ 100 = 4.0\%(\beta)$$

If direct comparisons are to be made between diffused air and mechanical aeration systems, one should relate the oxygen transfer rate to the rate of gross power input to the system. As no power input measurements were made during the studies reported here, calculated efficiencies are somewhat questionable.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The following conclusions have been reached as a result of the studies reported in the previous sections of this thesis:

(1) The gaseous tracer method can be used to determine the efficiency of aeration equipment under process conditions.

(2) The field tracer studies of aeration performance have demonstrated that the tracer method is practical, and that the results are precise and reproducible.

(3) Use of the gaseous tracer method need not result in radiation exposures approaching unacceptable limits to either personnel conducting the tests or the general public.

(4) Use of the gaseous tracer method can allow design engineers to specify a minimum aeration performance and then conduct full-scale field tests for compliance after the system is in operation.

Recommendations

Although it has been demonstrated that the tracer method can be used to accurately determine aeration performance under process conditions, it is also recognized that some additional work is required to fully specify aeration performance. It is recommended that the methodology be developed and demonstrated to measure with accuracy:

(1) The relative gas transfer capacity of wastewater to that of clean water (α).

(2) The relative saturation limit for dissolved oxygen in wastewater to that in clean water (β).

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APPENDIX

Table 1. Raw Counting Data

Kenwood Plant 6/25/71 Sta. A 5 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
AB1A	92	96	105	97	205	220	199	208	159622	158646	158859	159042
B	113	92	89	98	200	192	192	194	169353	168286	169358	168999
A01A	2213	2263	2289	2255	962	943	981	962	172172	171982	172556	172236
B	2205	2172	2309	2228	1022	967	993	994	170012	169084	167121	168739
A03A	4642	4596	4687	4641	1866	1798	1774	1812	164393	163310	163103	163602
B	4754	4673	4686	4704	1832	1866	1800	1832	178792	178223	176147	177720
A05A	6988	7014	7001	7001	2341	2419	2340	2366	169131	169169	168826	169042
B	7105	6924	6982	7003	2407	2521	2494	2474	173275	172137	170807	172073
A07A	6966	7124	7085	7058	2053	2051	2095	2066	169748	170939	170254	170313
B	7087	7242	7264	7197	2193	2198	2164	2185	177806	176350	177346	177167
A11A	7079	7279	6975	7111	1798	1746	1788	1777	172224	170007	170037	170756
B	7089	7082	7161	7110	1848	1866	1841	1851	168868	169800	170279	169649
A14A	7127	7086	7099	7104	1400	1354	1406	1386	174446	172836	172769	173350
B	7272	7195	7079	7182	1337	1264	1331	1310	175851	176066	176580	176165
A17A	6988	6971	7045	7001	922	936	962	940	168889	169865	169106	169286
B	7018	7016	7049	7027	989	923	920	944	171839	169074	171052	170655
A19A	6948	7114	6880	6980	634	609	621	621	173438	172988	170490	172305
B	6888	6939	6927	6918	620	632	657	636	172135	170020	170897	171017

Table 1. (Cont.)

Kenwood Plant 6/25/71 Sta. B 5 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
BB1A	90	88	96	91	209	236	221	222	166609	165058	166439	166035
B	100	95	96	97	195	215	202	204	169687	167764	166807	168086
BB3A	90	99	106	98	224	226	198	216	172153	166801	169039	169331
B	85	105	79	89	239	214	235	229	166626	166158	164836	165873
B01A	5538	5555	5492	5528	1730	1814	1816	1786	167500	163146	164294	164980
B	5639	5625	5588	5617	1998	1984	1925	1969	166596	165308	166384	166096
B03A	7784	7695	7792	7757	2527	2544	2506	2525	163701	167700	164608	165336
B	7630	7735	7823	7729	2571	2540	2468	2526	166683	166804	165698	166395
B04A	7407	7642	7561	7536	2586	2544	2552	2560	164977	164235	164097	164436
B	7461	7560	7488	7503	2303	2432	2331	2355	168348	167128	165359	166945
B05A	7160	7246	7240	7215	2387	2352	2311	2350	167792	166214	165441	166482
B	7142	7237	7265	7214	2509	2606	2593	2569	165558	168153	164768	166159
B07A	7059	7151	7139	7116	2150	2152	2156	2152	164264	166361	164202	164942
B	6993	7208	7061	7087	1777	1765	1776	1772	166440	164724	167058	166074
B09A	6692	6840	6861	6797	1837	1831	1804	1824	161840	157085	158390	159105
B	6879	6961	6913	6917	1892	1888	1974	1918	163974	164951	163840	163955
B11A	6815	6811	6738	6788	1660	1553	1628	1613	168246	164484	164791	165840
B	6866	6888	6978	6910	1782	1812	1826	1806	166023	165341	164753	165372
B14A	6667	7018	6968	6884	1396	1430	1401	1409	167107	168625	167329	167687
B	6860	6927	6918	6901	1451	1421	1415	1429	167541	164533	162743	164939
B17A	6807	6793	6846	6815	1094	1094	1039	1075	165533	164667	166351	165517
B	6895	6893	6945	6911	1056	1003	939	999	168254	167442	167652	167782
B19A	6419	6434	6447	6433	739	716	680	711	152757	151793	151592	152047
B	6477	6711	6667	6618	760	708	780	749	160372	159119	158224	159238
B23A	6630	6676	6723	6676	323	329	316	322	169147	168553	165963	167887
B	6670	6654	6639	6654	319	325	330	324	169932	168112	166511	168185
B25A	6508	6612	6619	6579	250	270	246	255	167764	166533	166737	167011
B	6501	6528	6484	6504	276	265	262	267	172482	167421	167654	169185

Table 1. (Cont.)

Kenwood Plant   6/25/71   Sta. B   5 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
B27A	6651	6583	6457	6563	224	210	258	230	168272	165189	163160	165540
B	6634	6464	6578	6575	206	247	210	221	165044	164320	161417	163593
B28A	6361	6530	6431	6440	220	221	227	222	164888	161876	161835	162866
B	6488	6506	6622	6538	226	216	196	212	168225	167209	164388	166607
B29A	6216	6109	6174	6166	202	201	220	207	170630	169782	169191	169884
B	6497	6605	6443	6515	214	200	192	202	168656	167294	166937	167629
B30A	6209	6316	6261	6262	187	217	209	204	162569	164428	162214	163070
B	6490	6417	6516	6474	216	191	219	208	165479	163102	162286	163622

Table 1. (Cont.)

Kenwood Plant 7/2/71 Sta. A 5 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg
AB1A	267	262	259	262	208	194	216	206	166452	162577	165428	164819
B	271	273	257	267	228	228	177	211	167289	165848	166093	166410
A01A	255	273	235	254	221	201	200	207	167350	164478	163905	165244
B	226	257	251	244	214	211	213	212	164631	166889	164072	165197
A02A	1659	1677	1666	1667	795	707	751	751	166556	166393	166323	166424
B	1705	1681	1764	1716	783	781	795	788	166947	166780	166532	166753
A03A	4686	4677	4636	4666	1847	1796	1887	1843	167432	167161	164499	166364
B	4651	4804	4650	4701	1904	1973	1810	1895	164362	163617	165683	164554
A04A	6259	6132	6162	6184	2126	2296	2168	2196	167374	167678	165002	166684
B	6110	6283	6094	6162	2270	2219	2312	2267	164953	163450	160786	163063
A05A	6785	6954	6998	6912	2283	2334	2263	2293	167622	165274	167149	166681
B	6948	6928	6910	6928	2245	2150	2205	2200	167182	166021	166972	166725
A07A	7037	7078	7121	7078	2063	2116	2051	2076	168792	165480	167434	167235
B	6939	7192	7128	7086	2124	2106	2081	2103	166289	169170	165928	167129
A09A	7081	7066	7033	7060	1523	1538	1394	1485	161642	165456	161538	162878
B	7099	7266	6960	7108	1416	1496	1364	1425	166259	165540	162129	164642
A11A	6891	7063	6941	6965	1091	1070	1053	1071	165946	165931	166284	166053
B	7063	7137	7060	7086	1024	1114	1096	1078	169577	166552	165768	167299
A13A	6928	6868	6866	6887	826	812	806	814	166207	163480	162194	163960
B	7056	6874	7062	6997	813	780	764	785	163932	166678	166088	165566
A15A	7018	6871	6950	6946	566	606	559	577	165094	169298	166921	167104
B	6897	6870	6931	6899	545	591	588	574	165258	163540	164940	164579
A17A	6998	6804	6766	6856	435	496	480	470	165154	165975	163888	165005
B	6952	6859	7088	6966	418	495	444	452	167070	168223	164368	166553
A19A	6940	6790	6933	6887	354	380	418	384	165823	164990	164395	165069
B	6836	6881	6961	6892	408	338	329	358	164233	165527	162753	164171
A21A	6780	6790	6848	6806	312	327	339	326	165048	161125	163686	163286
B	7047	6862	6909	6939	352	353	345	350	173196	173664	169838	172232

Table 1. (Cont.)

Kenwood Plant 7/2/71 Sta. A 5 min. counts

Spl. No.	Tritium channel counts I	II	III	Avg.	Krypton-85 channel counts I	II	III	Avg.	AES channel counts I	II	III	Avg.
A23A	6809	6829	7009	6882	296	260	328	294	165709	165612	163166	164829
B	6851	6919	6963	6911	318	275	298	297	166459	164698	163468	164875
A25A	6699	6798	6681	6726	253	291	254	266	167363	168179	166306	167282
B	6690	6779	6905	6791	232	258	312	267	166786	164422	162579	164595

Table 1. (Cont.)

Kenwood Plant 7/2/71 Sta. B 5 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
BB1A	242	249	294	261	194	197	186	192	170399	171136	171144	170893
B	269	234	262	255	211	211	210	210	171549	169553	170104	170402
BB2A	227	279	251	252	178	209	224	203	174244	174075	172737	173685
B	257	248	240	248	196	194	237	209	171392	169267	169151	169936
B01A	290	246	247	261	184	205	210	199	168182	167124	166175	167160
B	239	245	261	248	209	201	205	205	171580	170558	171153	171097
B02A	12134	12139	12462	12245	4928	4904	4945	4925	165185	162201	167473	164953
B	12281	12450	12205	12312	5006	4935	4938	4959	165503	165242	162575	164440
B03A	9172	9073	9102	9115	3404	3376	3481	3420	169159	171042	167855	169352
B	9037	9017	9103	9052	3383	3366	3365	3371	170851	168939	168469	169419
B04A	7958	7960	8002	7973	2949	2896	2794	2879	165246	164120	163818	164394
B	7824	7897	7938	7903	2874	2852	2729	2818	166694	168481	168564	167913
B05A	7348	7307	7342	7332	2448	2447	2481	2458	170254	167125	166943	168107
B	7339	7278	7130	7249	2506	2512	2553	2523	169930	168004	170776	169570
B07A	7190	7005	7310	7168	2130	2134	2063	2109	170270	168657	168735	169220
B	7200	7158	7115	7157	2164	2107	2081	2117	171548	169256	169624	170142
B09A	7003	7034	6998	7011	1475	1364	1434	1441	168139	168677	168035	168283
B	7157	7117	7162	7145	1459	1465	1498	1474	170486	169626	167378	169163
B11A	7177	6943	6973	7031	1061	1048	1001	1036	167184	165945	166848	166659
B	7027	7072	7090	7063	1002	1029	1033	1021	167292	166586	170396	168091
C	7034	7063	7079	7058	1041	1080	1052	1057	168623	169005	167405	168344
B13A	7102	7054	6932	7029	802	738	812	784	168113	164675	164768	165852
B	7235	7019	6943	7065	772	764	754	763	174974	170716	171419	172369
B15A	6821	6859	7054	6911	602	560	538	566	165808	165855	167173	166278
B	7076	7112	7124	7104	606	576	578	586	169753	171216	167463	169477
B17A	6891	7072	6956	6973	456	468	463	462	174452	174154	174544	174383
B	6857	6969	6983	6936	455	433	451	446	171259	172310	167821	170463

Table 1. (Cont.)

Kenwood Plant 7/2/71 Sta. B 5 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
B19A	6881	7083	7033	6999	352	359	373	361	171065	172233	170207	171168
B	6854	7037	6963	6951	423	360	380	387	171344	168862	171242	170482
B21A	6834	6745	7061	6880	318	335	332	328	170955	168251	168844	169350
B	6953	6958	6886	6932	319	298	351	322	171772	170668	168675	170371
B23A	6834	6988	6709	6843	317	325	272	304	167855	166096	164792	166247
B	7027	6770	6881	6892	269	288	299	285	170699	167534	166858	168363
B25A	6853	6925	6836	6871	266	277	287	276	168382	169201	166663	168082
B	6856	6857	6874	6862	260	267	271	266	167288	167027	168053	167456

Table 1. (Cont.)

Kenwood Plant 7/9/71 Sta. A 5 min. counts

Spl. No.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
AB1A	244	280	244	256	208	230	196	211	163788	163349	163727	163621
B	265	250	271	262	187	218	194	199	169930	166733	167258	167973
A01 A	1043	1019	995	1019	525	553	540	539	164795	164041	163058	163964
B	991	961	977	976	560	510	534	534	168755	166880	167816	167817
A02 A	3947	3920	3939	3935	1786	1730	1824	1780	165906	164875	162267	164349
B	3885	4048	4000	3977	1844	1820	1770	1811	166484	163333	161857	163891
A03 A	5584	5789	5649	5674	2439	2418	2298	2385	163787	162241	162674	162900
B	5655	5720	5675	5683	2404	2308	2414	2375	162405	161702	161287	161798
A04 A	6729	6798	6731	6752	2571	2656	2696	2641	165112	161860	162446	163139
B	6816	6781	6951	6849	2674	2580	2599	2617	165233	164246	162760	164079
A05 A	7121	7190	7187	7166	2592	2555	2603	2583	164860	165141	166565	165522
B	7050	7125	7200	7125	2657	2621	2684	2654	167224	164141	163767	165044
A07 A	7252	7120	7212	7194	2208	2133	2083	2141	166274	164582	163198	164684
B	7012	7017	7228	7085	2144	2146	2119	2136	166474	161986	163410	163956
A08 A	7090	7150	7099	7113	1643	1618	1605	1622	166972	165125	162988	165028
B	7054	7137	7031	7074	1698	1739	1667	1701	164118	163732	161147	162999
A10 A	6936	6943	6883	6920	1142	1214	1158	1171	160822	161142	160845	160936
B	7092	7123	7064	7093	1239	1229	1290	1252	164351	163241	162699	163430
A12 A	7043	6987	7110	7046	838	833	843	838	166518	165781	165539	165946
B	6983	7101	7006	7030	883	896	822	867	164107	162753	163376	163412
A14 A	7140	7143	6832	7038	617	678	621	638	166573	164165	163372	164703
B	6933	7007	7145	7028	615	670	657	647	169764	166515	166211	167496
A16 A	6952	6999	6899	6950	468	494	483	481	165054	163838	162416	163769
B	7111	6970	6850	6977	464	483	473	473	167189	166023	164933	166048
A18 A	7015	6960	6980	6985	408	400	373	393	163938	160327	162528	162264
B	7003	7006	7058	7022	420	391	381	397	169162	167508	167486	168052

Table 1. (Cont.)

Kenwood Plant 7/9/71 Sta. B 5 min. counts

Spl	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
BB2A	257	234	240	243	218	204	203	210	166464	168081	166447	166997
B	291	290	265	282	168	172	204	181	166903	166393	166248	166514
B01A	2714	2829	2682	2741	1167	1188	1240	1198	168959	166560	166745	167421
B	2740	2763	2882	2795	1242	1211	1134	1195	166472	165507	163950	165309
B02A	8693	8485	8610	8596	3715	3751	3740	3735	165795	165542	162715	164684
B	8756	8704	8748	8736	3786	3657	3774	3739	173586	168056	168184	169942
C	8773	8613	8672	8686	3719	3766	3812	3765	171314	168797	169307	169806
B03A	8235	8353	8358	8315	3328	3241	3301	3290	167741	167471	167386	167532
B	8397	8311	8188	8298	3405	3410	3352	3389	165098	165846	165315	165419
B04A	7680	7815	7820	7771	2948	3022	2953	2974	166980	165063	165129	165724
B	7833	7816	7694	7781	2849	2893	2846	2862	170029	168272	165900	168067
B05A	7478	7288	7446	7404	2659	2654	2649	2654	167483	165153	165486	166040
B	7338	7392	7338	7356	2605	2617	2657	2626	170796	166348	166199	167781
B07A	7221	7261	7145	7209	2131	2171	2191	2164	165868	164427	164054	164783
B	7036	7154	7210	7133	2157	2099	2217	2157	168818	169882	168386	169028
B08A	7136	7132	7128	7132	1698	1715	1736	1716	166258	166594	163874	165575
B	7074	7202	7175	7150	1745	1788	1776	1769	164218	165749	162775	164247
B10A	6826	7017	7082	6975	1245	1207	1282	1244	167363	162495	164302	164720
B	7042	6998	7041	7027	1251	1236	1223	1236	160987	163758	161478	162074
B12A	6887	6970	7004	6953	827	870	892	863	165662	163550	164273	164495
B	6993	7047	7020	7020	857	871	862	863	164036	164706	164980	164574
B14A	7022	7002	7070	7031	604	653	671	642	166008	165478	164391	165292
B	6811	7025	7084	6973	636	639	616	630	164982	165129	164432	164847
B16A	6964	6970	6934	6956	488	498	444	476	167013	165998	165169	166060
B	6910	6994	6931	6945	499	494	460	484	164528	163185	163680	163797
B18A	7228	7073	7136	7145	356	387	374	372	167327	165713	164388	165809
B	6985	6916	6988	6963	413	417	380	403	170861	168367	165784	168337

Table 1. (Cont.)

South Cobb Plant 7/15/71 Sta. A 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
AB1A	175	159	189	174	396	413	477	428	156298	160731	161896	159641
B	178	195	189	187	419	453	373	415	163740	163870	164461	164023
A01A	8548	8433	8728	8569	4054	3872	3953	3959	166823	168688	168535	168015
B	8583	8609	8580	8590	3942	4046	3850	3946	164191	164595	164160	164315
A02A	5908	5944	5965	5939	2373	2345	2432	2383	165243	165193	164849	165095
B	6046	5895	6114	6018	2430	2415	2416	2420	160758	163562	161875	162065
A03A	4447	4511	4525	4494	1684	1672	1691	1682	166822	165400	165121	165781
B	4643	4702	4588	4644	1632	1653	1715	1666	161911	163134	162828	162624
A04A	4010	3916	4002	3976	1290	1305	1257	1284	164686	163287	162169	163380
B	3983	4052	4013	4016	1343	1296	1282	1307	167873	170135	167992	168666
A05A	3718	3639	3577	3644	1122	1034	1067	1074	168925	169254	169083	169087
B	3703	3591	3655	3649	1021	1096	989	1035	167483	164703	165101	165762
A06A	3356	3301	3387	3348	864	872	870	868	166691	167106	166740	166845
B	3356	3380	3234	3323	909	883	954	915	170592	169674	170632	170299
A08A	2912	3008	2920	2946	751	680	660	697	166339	167036	167161	166845
B	2911	2915	2902	2909	621	700	681	667	169302	169324	168869	169165
A10A	2664	2718	2711	2697	597	567	563	575	165064	165425	162851	164446
B	2784	2753	2758	2765	517	578	586	560	167570	166158	167841	167189
A12A	2663	2553	2646	2620	479	578	552	536	169779	170949	169054	169927
B	2649	2679	2702	2676	498	509	544	517	169017	167203	167570	167930
A14A	2588	2564	2546	2566	498	497	497	497	165598	167840	164185	165874
B	2620	2563	2532	2571	467	476	474	472	165650	163940	166695	165428

Table 1. (Cont.)

South Cobb Plant 7/15/71 Sta. B 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
BB2A	186	185	186	185	436	422	443	433	166145	166311	165896	166117
B	160	210	180	183	419	361	464	414	171867	173724	171002	172197
B01A	5132	5135	5300	5189	2565	2581	2550	2565	168137	171051	169124	169437
B	5231	5212	5138	5193	2561	2508	2493	2520	166628	167640	166996	167088
B02A	4538	4507	4442	4495	1994	1805	1889	1896	167864	169310	168335	168503
B	4507	4437	4395	4446	1859	1850	1865	1858	161848	163621	162979	162816
B03A	4117	4107	4045	4089	1515	1431	1499	1481	164235	166378	166665	165759
B	4030	4089	4166	4095	1528	1466	1514	1502	165234	166556	167972	166587
B04A	3297	3353	3256	3302	1165	1065	1088	1106	167274	169344	166721	167779
B	3342	3339	3335	3338	1041	1114	1050	1068	166887	165501	167033	166473
B05A	3588	3341	3459	3462	1013	1043	960	1005	165828	166575	166123	166175
B	3367	3422	3398	3395	992	980	1043	1005	163009	165168	164241	164139
B06A	3138	3187	3146	3157	840	825	842	835	164400	162466	163082	163316
B	3266	3329	3267	3287	898	860	852	870	167344	169182	168678	168401
B07A	2972	2979	3030	2993	754	789	738	760	164624	167553	165933	166036
B	3034	3252	3191	3159	782	757	755	764	166625	166266	166731	166540
B08A	2953	2930	2946	2943	659	666	682	669	164894	165705	164790	165129
B	2932	2898	2926	2918	655	664	653	657	166745	167540	167133	167139
B09A	2854	2898	2888	2880	609	624	613	615	167135	165012	166649	166265
B	2946	2879	2867	2897	641	680	640	653	169151	170278	170154	169861
B10A	2774	2758	2669	2733	582	573	554	571	165111	165618	166541	165756
B	2791	2753	2854	2799	585	520	526	543	166029	166272	166002	166101

Table 1. (Cont.)

South Cobb Plant 7/15/71 Sta. C 10 min. counts

Spl. No.	Tritium channel counts I	II	III	Avg.	Krypton-85 channel counts I	II	III	Avg.	AES channel counts I	II	III	Avg.
C01A	353	401	339	364	474	465	456	465	168040	169241	167448	168243
B	365	390	357	370	498	439	492	476	166727	165703	167678	166702
C02A	1135	1136	1168	1146	620	659	652	643	164672	164077	164425	164391
B	1050	1073	1056	1059	649	677	669	665	164829	164981	165130	164980
C03A	1661	1717	1707	1695	752	718	713	727	167602	168227	167197	167675
B	1722	1751	1713	1728	745	747	731	741	166454	165773	166657	166294
C04A	1925	1986	1976	1962	705	690	684	693	168018	168126	168086	168076
B	1891	1956	1938	1928	697	687	712	698	168674	167665	167017	167785
C05A	2139	2114	2222	2158	651	664	672	662	163743	163837	163036	163538
B	2143	2236	2208	2195	669	697	675	680	166622	167323	167209	167051
C06A	2365	2418	2354	2379	602	606	634	614	165914	165378	166152	165814
B	2402	2322	2287	2337	640	637	652	643	167503	165907	164338	165916
C07A	2607	2684	2774	2688	633	577	622	610	163174	164787	166144	164701
B	2648	2562	2548	2586	635	609	613	619	167773	165819	166050	166547
C08A	2614	2649	2625	2629	595	522	573	563	166382	165677	165406	165821
B	2510	2588	2669	2589	556	551	589	565	161857	162254	163897	162669
C09A	2570	2728	2627	2641	550	537	588	558	168857	165607	167748	167404
B	2617	2717	2624	2652	558	605	547	570	170741	171651	171317	171236

Table 1. (Cont.)

South Cobb Plant 7/22/71 Sta. A 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
AB1A	200	172	158	176	422	426	431	426	148399	150632	149444	149491
B	193	167	160	173	422	417	418	419	158856	157681	154909	157148
A01A	9171	9045	9120	9112	4567	4565	4660	4597	160079	159519	159929	159842
B	9195	9196	9092	9161	4436	4629	4571	4545	162575	158173	157558	159435
A02A	5992	6031	6215	6079	2715	2738	2717	2723	160373	159729	159869	159990
B	6259	6234	6056	6183	2836	2794	2767	2799	159965	159415	157238	158872
A03A	4138	4325	4273	4245	1565	1572	1584	1573	170229	168475	165276	167993
B	4206	4331	4265	4267	1509	1544	1566	1539	165977	161863	160914	162918
A04A	3661	3632	3667	3653	1214	1119	1216	1183	169027	165591	161987	165535
B	3788	3669	3666	3707	1184	1180	1188	1184	164981	160912	160877	162256
A05A	3248	3391	3321	3320	1018	1060	1008	1028	163220	160718	157582	160506
B	3407	3320	3328	3351	1043	1065	995	1034	168090	165180	161667	164979
A06A	3156	3022	3164	3114	822	858	787	822	165648	162129	159669	162482
B	3143	3096	3134	3124	826	775	813	804	163495	157430	159109	160011
A07A	2976	3015	2902	2964	713	702	696	703	160867	157430	157461	158586
B	2917	2985	2903	2935	758	654	750	720	163231	159546	157598	160125
A08A	2756	2870	2843	2823	669	646	608	641	163091	157793	156146	159010
B	2812	2783	2779	2791	635	645	635	638	162626	160712	159709	161015
A09A	2701	2653	2626	2660	611	614	631	618	161810	159049	159168	160009
B	2799	2626	2660	2695	562	589	588	579	163212	159179	158062	160151
A10A	2659	2631	2662	2650	537	526	561	541	164126	157521	160041	160562
B	2635	2555	2663	2617	562	558	512	544	162794	159616	157127	159845

Table 1. (Cont.)

South Cobb Plant   7/22/71   Sta. B   10 min. counts

Spl. No.	Tritium channel counts I	II	III	Avg.	Krypton-85 channel counts I	II	III	Avg.	AES channel counts I	II	III	Avg.
BB1A	205	186	187	192	399	399	420	406	162816	160130	160259	161068
B	209	183	194	195	399	434	427	420	160243	158930	157091	158754
B01A	4033	4020	3959	4004	2210	2106	2145	2153	160178	159320	161026	160174
B	3956	3906	4194	4018	2120	2080	2104	2101	162368	161713	159806	161295
B02A	3770	3778	3745	3764	1706	1709	1723	1712	163390	159787	159620	160932
B	3752	3717	3682	3717	1644	1688	1738	1690	159031	155419	157319	157256
B03A	3858	3938	3901	3899	1454	1486	1524	1488	160973	158908	162515	160798
B	3905	3881	3865	3883	1480	1496	1520	1498	159886	157269	157818	158324
B04A	3457	3434	3470	3453	1201	1222	1175	1199	161286	160477	161352	161038
B	3459	3420	3489	3456	1181	1216	1150	1182	160513	161664	160497	160891
B05A	3115	3279	3303	3232	1025	962	937	974	163594	161811	160425	161943
B	3155	3254	3259	3222	1021	1008	948	992	163566	161318	161034	161972
B06A	3086	3063	3082	3077	801	811	902	838	164814	161807	160548	162389
B	3109	3012	3060	3060	827	856	865	849	163476	159893	161303	161557
B07A	2908	2847	2936	2897	717	740	715	724	159725	159751	158610	159362
B	2934	2908	2866	2902	720	678	745	714	162693	160644	159744	161027
B08A	2746	2752	2762	2753	683	646	627	652	161680	159445	161314	160813
B	2772	2749	2739	2753	691	675	652	672	164947	162833	164800	164193
B09A	2730	2736	2723	2729	611	606	587	601	159221	160757	158699	159559
B	2781	2767	2743	2763	610	627	581	606	159717	157731	158344	158597
B10A	2613	2722	2688	2674	587	546	555	562	167097	164252	165039	165462
B	2657	2732	2663	2684	586	587	568	580	161421	157834	160150	159801

Table 1. (Cont.)

South Cobb Plant 7/22/71 Sta. D 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
DB1A	197	178	176	183	439	405	440	428	161959	161915	161272	161715
B	176	188	189	184	409	400	426	411	159184	159031	159115	159110
D01A	542	490	534	522	544	528	538	536	162188	159696	157538	159807
B	496	498	485	493	534	548	536	539	160549	161537	160729	160938
D02A	2051	2064	2080	2065	1095	1065	1090	1083	162107	157978	160471	160185
B	2058	2039	2016	2037	1052	1083	1093	1076	163921	163302	161682	162968
D03A	2423	2398	2323	2381	1070	1042	1031	1047	168312	164045	165540	165965
B	2391	2379	2393	2387	965	957	1005	975	160570	159550	161629	160583
D04A	2711	2781	2720	2737	975	1009	1043	1009	163979	161323	163190	162830
B	2820	2747	2750	2772	988	1026	1023	1012	162337	162162	162339	162279
D05A	2607	2579	2629	2605	872	865	842	859	163981	161775	160887	162214
B	2612	2589	2696	2632	841	882	870	864	161445	160514	159860	160606
D06A	2632	2551	2520	2567	761	783	733	759	162363	159904	159221	160496
B	2654	2638	2620	2637	772	752	743	755	162617	160406	161273	161432
D07A	2674	2645	2655	2658	679	765	691	711	159480	160053	159893	159808
B	2560	2599	2695	2618	695	711	736	714	160307	160304	159250	159953
D08A	2663	2629	2654	2648	631	619	656	635	160120	157799	159027	158982
B	2635	2775	2657	2689	620	622	645	629	162130	159739	160554	160807
D09A	2590	2753	2657	2666	615	614	583	604	164435	161542	162941	162972
B	2665	2541	2639	2615	595	614	630	613	160069	160807	160296	160390
D10A	2692	2557	2578	2609	530	581	548	553	161502	158981	159598	160027
B	2721	2549	2680	2650	543	609	581	577	163759	163039	163387	163395

Table 1. (Cont.)

South Cobb Plant 7/22/71 Sta. E 10 min. counts

Spl. No.	Tritium channel counts I	II	III	Avg.	Krypton-85 channel counts I	II	III	Avg.	AES channel counts I	II	III	Avg.
EB1A	179	196	168	181	401	438	459	432	164733	161668	159893	162098
B	201	190	172	187	390	406	434	410	165387	165522	163543	164817
E01A	189	186	164	179	472	392	381	415	160841	159015	160229	160028
B	171	183	230	194	389	435	409	411	164691	162201	160416	162436
E02A	516	527	550	531	535	532	511	526	165734	162611	162695	163680
B	510	564	512	528	503	536	528	522	158080	156483	158946	157836
E03A	1219	1202	1222	1214	658	674	721	684	160926	159823	160184	160311
B	1211	1229	1260	1233	674	723	693	696	160313	157788	158167	158756
E04A	1749	1822	1756	1775	772	736	748	752	166434	163198	164719	164783
B	1762	1787	1819	1789	725	737	739	733	160536	158979	161045	160186
E05A	2166	2048	2163	2125	747	728	745	740	167752	167068	165631	166817
B	2127	2131	2214	2157	750	779	761	763	169111	167027	168446	168194
E06A	2190	2231	2386	2269	702	709	702	704	162176	161320	161714	161736
B	2336	2300	2202	2279	655	644	707	668	163640	162339	161092	162357
E07A	2398	2429	2491	2439	673	615	680	656	163263	161183	162908	162451
B	2448	2436	2477	2453	692	680	691	687	161084	160451	160504	160679
E08A	2566	2532	2465	2521	644	602	561	602	167437	162893	166565	165631
B	2534	2516	2499	2516	626	625	659	636	159898	160461	158669	159676
E09A	2554	2580	2602	2578	622	551	558	577	163413	160328	160876	161539
B	2578	2559	2576	2571	614	604	593	605	163993	160188	161437	161872
E10A	2664	2738	2593	2665	544	559	573	558	165804	165009	164057	164956
B	2652	2547	2625	2608	557	585	528	556	159644	161067	163975	161562

Table 1. (Cont.)

South Cobb Plant 8/4/71 Sta. A 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
AB1A	194	174		184	385	459		422	152647	155597		154122
B	213	158		185	445	421		433	153896	153399		153647
A01A	6400	6562		6481	3166	3210		3188	157716	157059		157387
B	6419	6360		6389	3274	3210		3242	159005	158833		158919
A02A	5562	5429		5495	2511	2475		2493	157240	157335		157287
B	5615	5458		5536	2500	2514		2507	162815	163358		163086
A03A	4476	4497		4486	1784	1852		1818	161080	159914		160497
B	4391	4389		4390	1708	1719		1713	159374	160035		159704
A04A	3920	3929		3924	1399	1430		1414	160683	161449		161066
B	3850	3810		3830	1439	1354		1396	158489	159699		159094
A05A	3409	3381		3395	1076	1156		1116	157563	160479		159021
B	3404	3498		3451	1168	1230		1199	160014	159473		159743
A06A	3145	3275		3210	939	975		957	157634	159296		158465
B	3258	3285		3271	961	912		936	158130	159268		158699
A07A	3022	3055		3038	824	860		842	156411	154899		155655
B	3057	3008		3032	849	830		839	157219	158951		158085
A08A	3002	2985		2993	784	692		738	159755	157849		158802
B	2981	2847		2914	758	745		751	158585	159398		158991
A09A	2832	2844		2838	665	674		669	163834	164767		164300
B	2765	2789		2777	665	609		637	155522	155650		155586
A10A	2657	2735		2696	590	544		567	157118	155793		156455
B	2807	2627		2717	643	585		614	158314	156914		157614
A11A	2637	2531		2584	566	584		575	157447	155211		156329
B	2530	2668		2599	559	540		549	157770	157316		157543

Table 1. (Cont.)

South Cobb Plant 8/4/71 Sta. B 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
BB1A	163	202		182	428	395		411	156362	157104		156733
B	200	188		194	394	429		411	157417	156797		157107
B01A	4447	4546		4496	2197	2187		2192	153424	151888		152656
B	4463	4503		4483	2187	2190		2188	153750	152635		153192
B02A	4002	3955		3978	1755	1758		1756	157530	158217		157873
B	3957	3998		3977	1706	1750		1728	158300	155920		157110
B03A	3826	3893		3859	1419	1430		1424	161463	163032		162247
B	3768	3817		3792	1470	1491		1480	159729	159964		159846
B04A	3549	3518		3533	1174	1127		1150	158448	158988		158718
B	3447	3506		3476	1197	1206		1201	159866	160888		160377
B05A	3278	3237		3257	1007	1043		1025	161596	160343		160969
B	3188	3184		3186	1021	976		998	161800	161406		161603
B06A	2918	3144		3031	889	869		879	155626	154291		154958
B	3037	3053		3045	864	866		865	162737	160598		161667
B07A	2946	2905		2925	785	760		772	164604	163799		164201
B	2877	2983		2930	775	777		776	162777	161081		161929
B08A	2878	2901		2889	699	655		677	160498	162354		161426
B	2887	2855		2871	702	678		690	159684	157585		158634
B09A	2821	2745		2783	543	576		559	157320	156384		156852
B	2726	2826		2776	645	639		642	162368	162305		162336
B10A	2683	2758		2720	566	578		572	159007	157397		158202
B	2603	2638		2620	582	607		594	156581	156250		156415

Table 1. (Cont.)

South Cobb Plant 8/4/71 Sta. D 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
DB1A	173	178		175	376	429		402	156150	154231		155190
B	165	170		167	391	414		402	153598	155903		154750
D01A	203	182		192	376	406		391	157921	157750		157835
B	163	187		175	376	413		394	157069	156047		156558
D02A	1842	1776		1809	1050	1112		1081	154814	154230		154522
B	1898	1833		1865	1030	1064		1047	153784	154003		153893
D03A	2438	2491		2464	1143	1179		1161	157206	156999		157102
B	2507	2478		2492	1126	1170		1148	158613	159824		159218
D04A	2706	2650		2678	1081	1073		1077	154713	155652		155182
B	2791	2702		2746	1035	1004		1019	159941	160516		160228
D05A	2635	2637		2636	918	924		921	155022	154013		154517
B	2659	2757		2708	917	921		919	154339	155566		154952
D06A	2624	2557		2590	861	833		847	158070	159148		158609
B	2663	2650		2656	819	806		812	159206	158021		158613
D07A	2695	2685		2690	699	771		735	155593	152218		153905
B	2773	2774		2773	741	716		728	163434	163658		163546
D08A	2608	2551		2579	683	687		685	157683	157694		157688
B	2653	2592		2622	646	657		651	158567	158283		158425
D09A	2771	2657		2714	648	658		653	159156	160831		159993
B	2621	2716		2668	605	621		613	158105	158825		158465
D10A	2636	2655		2645	605	539		572	162954	162740		162847
B	2587	2703		2645	537	580		558	155660	153332		154496
D11A	2619	2676		2647	569	562		565	156347	157867		157107
B	2649	2705		2677	531	577		554	159864	159555		159709

Table 1. (Cont.)

South Cobb Plant 8/4/71 Sta. E 10 min.counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
EB1A	188	160		174	424	393		408	155805	155266		155535
B	170	181		175	380	421		400	152898	156094		154496
E01A	177	220		198	423	410		416	155169	153647		154408
B	226	225		225	407	444		425	154613	153665		154139
E02A	812	838		825	641	626		633	153125	153884		153504
B	871	833		852	659	611		635	156501	156970		156735
E03A	1331	1264		1297	705	702		703	158889	157706		158297
B	1282	1199		1240	702	670		686	153429	152518		152973
E04A	1728	1796		1762	801	763		782	154377	154677		154527
B	1753	1862		1807	789	757		773	153374	155191		154282
E05A	2157	2153		2155	750	699		724	156147	154036		155091
B	2152	2090		2121	750	727		738	155739	155135		155437
E06A	2249	2255		2252	684	700		692	157035	154512		155773
B	2285	2213		2249	693	710		701	155757	155971		155864
E07A	2490	2442		2466	708	689		698	151568	151178		151373
B	2421	2431		2426	700	639		669	156489	155444		155966
E08A	2549	2552		2550	631	585		608	156273	157197		156735
B	2566	2509		2537	587	605		596	153810	154546		154178
E09A	2529	2884		2706	610	576		593	156152	155721		155936
B	2608	2647		2627	554	573		563	158729	157387		158058
E10A	2564	2502		2533	550	509		529	155658	153570		154614
B	2578	2622		2600	574	537		555	155298	155068		155183
E11A	2715	2622		2668	503	499		501	156361	155129		155745
B	2655	2675		2665	503	529		516	156786	154573		155679
E12A	2642	2623		2632	508	529		518	159633	155598		157615
B	2581	2675		2628	516	526		521	155351	155766		155558

Table 1. (Cont.)

South River Plant (I) 8/16/71 Sta. A 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
AB1A	222	170	195	195	393	434	382	403	146365	144403	144403	145057
B	174	172	190	178	404	414	416	411	147264	146887	145753	146634
A01A	5018	5049	5017	5028	2966	2861	2715	2847	147122	145443	145664	146076
B	5076	4973	4945	4998	2755	2662	2783	2733	146204	145500	146027	145910
A02A	3746	3676	3608	3676	1989	2001	1893	1957	146392	143670	146444	145502
B	3641	3624	3661	3642	1928	1958	2013	1966	143500	142712	143890	143367
A03A	3157	3051	3108	3105	1586	1577	1494	1552	144741	143840	146807	145129
B	3108	3132	3097	3112	1585	1573	1544	1567	149777	145429	147220	147475
A04A	2550	2624	2645	2606	1267	1205	1341	1271	144654	143868	142205	143575
B	2690	2566	2646	2634	1279	1324	1227	1276	147955	146957	144241	146384
A05A	2423	2351	2486	2420	1021	1050	1085	1052	144707	143399	142799	143635
B	2447	2406	2415	2422	1100	1097	1049	1082	144165	144848	148314	145775
A06A	2211	2123	2209	2181	993	921	898	937	145791	144478	144780	145016
B	2249	2226	2205	2226	953	949	1006	969	148851	148005	149834	148896
A07A	1973	1966	1975	1971	840	848	841	843	148084	146776	146218	147026
B	2013	1968	1944	1975	835	799	802	812	143359	141772	143892	143007
A08A	2024	2033	1979	2012	783	833	833	816	148932	147464	146727	147707
B	2092	2104	2070	2088	816	798	840	818	147392	146974	146076	146814
A09A	1771	1976	1877	1874	727	790	709	742	147437	146222	145853	146504
B	1889	1931	1913	1911	693	672	739	701	146316	146591	147203	146703
A10A	1899	1808	1797	1834	706	718	706	710	146998	149045	145066	147036
B	1813	1825	1781	1806	690	663	676	676	146488	142152	146137	144925
A11A	1814	1797	1772	1794	616	619	603	612	145914	143795	143812	144507
B	1833	1820	1738	1797	675	655	656	662	144020	144906	144032	144319
A12A	1734	1723	1715	1724	637	632	578	615	144233	144506	141008	143249
B	1821	1768	1747	1778	652	589	583	608	149721	145459	146400	147193
A13A	1790	1658	1724	1724	585	622	596	601	146930	147207	146579	146905
B	1679	1614	1722	1671	641	600	528	589	145260	146224	145965	145816

Table 1. (Cont.)

South River Plant (I) 8/16/71 Sta. B 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
BB1A	179	206	196	193	385	394	406	395	146282	146837	147050	146723
B	177	165	180	174	400	403	458	420	142756	144288	143872	143638
B01A	3475	3374	3481	3443	1898	1834	1923	1885	147481	144712	144482	145558
B	3327	3393	3339	3353	1947	1939	1930	1938	145363	146814	144394	145523
B02A	3603	3520	3520	3547	1818	1741	1842	1800	146924	143341	144225	144830
B	3486	3334	3436	3418	1765	1808	1867	1813	146439	143090	143381	144303
B03A	2906	2953	2939	2932	1441	1440	1482	1454	148432	148190	146338	147653
B	2869	2969	2892	2910	1370	1375	1450	1398	146681	145512	144396	145529
B04A	2600	2576	2747	2641	1151	1202	1187	1180	141379	141095	138947	140473
B	2820	2614	2568	2667	1245	1255	1269	1256	145334	144210	143263	144269
B05A	2478	2502	2488	2489	1061	1006	1059	1042	145461	145197	142259	144305
B	2526	2368	2391	2428	995	979	1111	1028	147200	146256	146572	146676
B06A	2339	2335	2420	2364	923	951	930	934	147085	147529	144655	146423
B	2359	2372	2313	2348	962	997	943	967	144308	143467	143970	143915
B07A	2164	2201	2219	2194	901	840	859	866	143625	146007	145088	144906
B	2164	2137	2204	2168	860	871	903	878	145756	147457	144717	145976
B08A	2115	1999	2061	2058	789	786	745	773	143273	143474	144759	143835
B	2033	2044	2011	2029	767	813	830	803	145100	145570	145786	145485
B09A	1977	1963	2006	1982	721	728	756	735	145604	145989	145096	145563
B	2031	2015	2032	2026	711	765	760	745	146934	145115	143131	145060
B10A	1918	1924	1939	1927	709	659	666	678	146051	145212	145389	145550
B	1922	1875	1848	1881	666	675	640	660	144311	144501	145890	144900
B11A	1946	1860	1824	1876	694	618	637	649	141785	144988	143289	143354
B	1936	1926	1951	1937	632	679	659	656	144127	146842	141779	144249
B12A	1836	1747	1856	1813	585	601	599	595	144128	144132	145058	144439

Table 1. (Cont.)

South River Plant (I) 8/16/71 Sta. C 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
CB1A	174	171	163	169	406	348	390	381	153286	151959	149370	151538
B	187	186	190	187	421	429	418	422	146563	144525	142481	144523
C01A	401	405	426	410	558	564	503	541	147525	146805	145317	146549
B	434	431	412	425	580	550	551	560	143893	145970	146788	145550
C02A	843	871	921	878	692	731	690	704	142181	140340	141257	141259
B	851	892	852	865	774	717	749	746	143291	145807	145818	144972
C03A	1869	1826	1873	1856	1147	1120	1078	1115	150230	146819	146235	147761
B	1830	1846	1782	1819	1127	1111	1083	1107	142672	144408	144265	143781
C04A	2208	2192	2224	2208	1121	1198	1270	1196	149422	146847	145676	147315
B	2195	2219	2236	2216	1198	1217	1109	1174	147790	146392	145112	146431
C05A	2442	2392	2462	2432	1264	1246	1149	1219	148782	148071	148314	148389
B	2411	2533	2478	2474	1210	1204	1220	1211	148932	146583	144687	146734
C06A	2509	2494	2511	2504	1182	1154	1075	1137	147308	145919	144557	145928
B	2443	2541	2507	2497	1164	1128	1049	1113	147881	148798	146979	147886
C07A	2398	2597	2508	2501	989	1016	998	998	147326	145100	144365	145597
B	2450	2423	2420	2431	996	1013	996	1001	145243	146728	145203	145724
C08A	2437	2418	2352	2402	895	899	968	920	147071	145664	146409	146381
B	2387	2348	2353	2362	920	945	982	949	147837	146786	146077	146900
C09A	2363	2282	2372	2339	797	830	801	809	147444	145756	144677	145959
B	2249	2276	2285	2270	815	856	922	864	148609	145215	143402	145742
C10A	2215	2211	2178	2201	796	782	798	792	148337	151271	146236	148614
B	2192	2286	2181	2219	740	810	756	768	144029	146283	142237	144183
C11A	2169	2070	2101	2113	730	769	752	750	149899	151897	147809	149868
B	2168	2176	2108	2150	779	748	706	744	148109	147638	146781	147509
C12A	2041	2109	2140	2096	678	693	713	694	149001	149305	145605	147970
B	2045	2072	2057	2058	728	671	699	699	147466	146144	146393	146667
C13A	1969	1926	1972	1955	679	623	662	654	142036	141842	140894	141607
B	1980	2007	1970	1985	626	708	666	666	150803	147450	144873	147708

Table 1. (Cont.)

South River Plant (II)   8/24/71   Sta. A   10 min. counts

Spl. No.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
AB1A	186	194	171	183	407	429	449	428	147810	147983	147228	147673
B	196	179	208	194	441	435	409	428	147181	149144	149445	148590
A01A	5319	5247	5202	5256	3077	3153	3061	3097	148945	147775	149634	148784
B	5087	5219	5297	5201	3087	3121	3104	3104	143741	145077	144520	144446
A02A	5317	5298	5412	5342	2880	2832	2859	2857	150161	147025	147741	148309
B	5206	5481	5350	5345	2862	2877	2715	2818	145778	145424	145220	145474
A03A	4359	4407	4390	4385	2215	2193	2237	2215	149244	151605	149975	150274
B	4378	4471	4317	4388	2183	2173	2170	2175	149756	148529	147549	148611
A04A	3733	3733	3797	3754	1797	1810	1760	1789	148515	147837	147782	148044
B	3881	3757	3806	3814	1837	1761	1796	1798	145725	148021	144566	146104
A05A	3297	3328	3307	3310	1534	1498	1480	1504	151637	150014	150239	150630
B	3332	3394	3329	3351	1513	1435	1489	1479	150445	146539	147716	148233
A06A	3009	2967	2916	2964	1251	1228	1273	1250	147570	147375	147526	147490
B	3049	3054	2984	3029	1336	1263	1227	1275	148457	145565	145431	146484
A07A	2478	2450	2470	2466	1050	1054	1079	1061	145393	144821	144763	144992
B	2458	2488	2513	2486	1037	1016	1005	1019	147247	148376	148277	147966
A08A	2455	2505	2501	2487	976	1046	940	987	154667	154309	153552	154176
B	2433	2495	2534	2487	985	1001	987	991	153614	153102	153032	153249
A09A	2307	2214	2293	2271	851	922	917	896	151111	149213	151069	150464
B	2226	2324	2158	2236	865	845	840	850	149675	149168	152019	150287
A10A	1978	1915	2030	1974	750	796	751	765	149929	150906	150267	150367
B	1927	1849	1983	1919	764	785	724	757	152287	151509	151977	151921
A11A	2001	1980	1924	1968	763	670	763	732	152568	150901	151564	151677
B	1998	1962	1904	1954	683	711	754	716	154154	153469	150666	152763
A12A	1768	1768	1773	1769	722	686	659	689	149326	148012	148128	148488
B	1766	1821	1805	1797	677	601	655	644	149475	146833	146301	147536
A13A	1664	1604	1659	1642	631	603	617	617	151238	152409	149757	151134
B	1614	1637	1641	1630	648	625	629	634	149769	150902	150834	150501

Table 1. (Cont.)

South River Plant (II) 8/24/71 Sta. D 10 min. counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
DB1A	158	186	192	178	425	448	404	425	144097	143841	143799	143912
B	187	189	212	196	415	407	410	410	146572	150093	149049	148571
D01A	717	702	715	711	699	681	685	688	150340	148853	148286	149159
B	675	686	724	695	679	704	644	675	148751	146163	146921	147278
D02A	1487	1506	1530	1507	1053	1029	999	1027	147689	147738	146735	147387
B	1573	1495	1457	1508	1059	1038	1007	1034	143816	146796	146367	145659
D03A	2267	2319	2231	2272	1282	1246	1260	1262	147116	145873	144741	145910
B	2179	2242	2165	2195	1201	1255	1187	1214	144491	145974	144456	144973
D04A	2734	2783	2731	2749	1340	1364	1367	1357	148452	147078	146425	147318
B	2834	2804	2643	2760	1314	1334	1322	1323	144048	145645	145986	145226
D05A	2654	2519	2695	2622	1177	1108	1103	1129	149670	151666	150363	150566
B	2516	2619	2548	2561	1164	1137	1102	1134	143217	145117	144482	144272
D06A	2569	2546	2667	2594	1081	1089	1102	1090	143192	145002	143356	143850
B	2678	2667	2591	2645	1160	1133	1087	1126	147459	147249	147608	147438
D07A	2562	2561	2634	2585	997	1014	1010	1007	146133	146431	147010	146524
B	2521	2637	2608	2588	1056	1025	1016	1032	142072	143457	142327	142618
D08A	2514	2505	2601	2540	942	1007	942	963	143226	144673	143018	143639
B	2434	2527	2535	2498	1011	1065	981	1019	144551	146665	145288	145501
D09A	2473	2491	2529	2497	854	833	905	864	150064	150393	148533	149663
B	2492	2464	2406	2454	825	848	845	839	145380	146808	146478	146222
D10A	2307	2371	2267	2315	804	819	784	802	143612	146561	145086	145086
B	2323	2262	2283	2289	781	791	744	772	144278	145333	146426	145345
D11A	2271	2313	2163	2249	753	738	787	759	145365	144728	144281	144791
B	2312	2295	2287	2298	799	831	756	795	144896	144748	144826	144823
D12A	2248	2260	2185	2231	730	718	681	709	143953	146500	145873	145442
B	2283	2177	2277	2245	734	716	733	727	149028	147712	148602	148447
D13A	2024	2072	2012	2036	673	653	708	678	145974	146437	144657	145689
B	2021	2099	2039	2053	627	651	712	663	142464	143845	142117	142808

Table 1. (Cont.)

South River Plant (II) 8/24/71 Sta. E 10 min.counts

Spl.	Tritium channel counts				Krypton-85 channel counts				AES channel counts			
No.	I	II	III	Avg.	I	II	III	Avg.	I	II	III	Avg.
EB1A	200	191	178	189	446	423	429	432	151097	150490	149663	150416
B	221	179	142	180	447	432	417	432	140112	142947	143213	142090
E01A	328	329	309	322	444	519	481	481	149826	150399	147605	149276
B	310	307	303	306	462	493	498	484	143383	145068	146514	144988
E02A	967	908	886	920	721	706	732	719	143103	143404	141405	142637
B	879	910	880	889	711	725	721	719	148756	151621	149742	150039
E03A	1495	1532	1511	1512	948	955	957	953	143267	143932	143317	143505
B	1487	1522	1543	1517	945	910	868	907	140302	143669	143654	142541
E04A	1856	1843	1897	1865	992	1044	1043	1026	146205	147458	144160	145941
B	1886	1856	1905	1882	1011	1005	1051	1022	143380	146323	144910	144871
E05A	2072	2075	2022	2056	979	1035	1031	1015	142069	146180	145881	144710
B	2051	2065	2008	2041	971	1042	989	1000	145494	147115	145373	145994
E06A	2247	2142	2198	2195	937	977	966	960	144505	144923	146855	145427
B	2287	2260	2311	2286	1005	994	1022	1007	148097	150556	149065	149239
E07A	2272	2235	2374	2293	1005	964	967	978	142047	143224	142641	142637
B	2402	2251	2392	2348	975	926	927	942	142521	145235	147158	144971
E08A	2365	2368	2380	2371	916	943	928	929	145205	148828	144817	146283
B	2506	2437	2417	2453	970	887	914	923	148368	151163	149766	149765
E09A	2478	2410	2637	2508	940	866	872	892	150708	153112	153806	152542
B	2408	2330	2394	2377	842	812	845	833	144313	145089	143461	144287
E10A	2466	2475	2477	2472	831	809	775	805	148185	147802	150464	148817
B	2418	2388	2294	2366	813	809	819	813	145250	144002	144544	144598
E11A	2388	2364	2426	2392	768	789	791	782	145036	143376	143240	143884
B	2383	2405	2388	2392	795	709	743	749	144946	146888	145676	145836
E12A	2217	2334	2304	2285	655	710	706	690	149795	153631	151206	151544
B	2297	2234	2285	2272	723	744	719	728	144086	145191	143651	144309

Table 2. Ratio Computations

Kenwood Plant 6/25/71 Sta. A 5 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A01A	.0378	.2872	.8983	95	2160	212	750	28	778	866	2131	7420	.11675
B	.0383	.2838	.8965	95	2133	212	782	30	812	905	2102	7408	.12226
A03A	.0391	.2788	.8938	95	4546	212	1600	62	1662	1860	4483	16075	.11572
B	.0369	.2925	.9012	95	4609	212	1620	59	1679	1863	4549	15547	.11987
A05A	.0383	.2841	.8966	95	6906	212	2154	82	2236	2494	6823	24011	.10387
B	.0378	.2871	.8983	95	6908	212	2262	85	2347	2613	6822	23762	.10998
A07A	.0381	.2854	.8973	95	6963	212	1854	70	1924	2144	6892	24149	.08881
B	.0370	.2920	.9010	95	7102	212	1973	73	2046	2270	7028	24067	.09435
A11A	.0380	.2858	.8976	95	7016	212	1565	59	1624	1809	6956	24337	.07436
B	.0382	.2847	.8970	95	7015	212	1639	62	1701	1897	6952	24414	.07769
A14A	.0376	.2883	.8989	95	7009	212	1174	44	1218	1355	6964	24154	.05610
B	.0371	.2910	.9004	95	7087	212	1098	40	1138	1264	7046	24206	.05224
A17A	.0382	.2844	.8963	95	6906	212	728	27	755	842	6878	24184	.03485
B	.0380	.2857	.8975	95	6932	212	732	27	759	846	6904	24162	.03503
A19A	.0378	.2873	.8984	95	6885	212	409	15	424	472	6869	23907	.01976
B	.0380	.2860	.8977	95	6823	212	424	16	440	490	6806	23793	.02060

Table 2 (Cont.)

Kenwood Plant 6/25/71 Sta. B 5 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B01A	.0389	.2802	.8945	95	5433	212	1574	61	1635	1828	5371	19168	.09537
B	.0387	.2813	.8951	95	5522	212	1757	68	1825	2038	5453	19387	.10517
B03A	.0389	.2805	.8947	95	7662	212	2313	90	2403	2685	7571	26987	.09951
B	.0387	.2816	.8952	95	7634	212	2314	89	2403	2684	7544	26790	.10021
B04A	.0390	.2797	.8942	95	7441	212	2348	91	2439	2728	7349	26275	.10383
B	.0386	.2821	.8955	95	7408	212	2143	82	2225	2485	7325	25963	.09572
B05A	.0387	.2816	.8953	95	7120	212	2138	82	2220	2480	7037	24982	.09928
B	.0387	.2813	.8951	95	7119	212	2357	91	2448	2735	7027	24975	.10951
B07A	.0389	.2801	.8945	95	7021	212	1940	75	2015	2253	6945	24787	.09090
B	.0387	.2812	.8951	95	6992	212	1560	60	1620	1810	6931	24641	.07346
B09A	.0398	.2745	.8914	95	6702	212	1612	64	1676	1880	6637	24178	.07777
B	.0391	.2792	.8939	95	6822	212	1706	66	1772	1982	6755	24191	.08196
B11A	.0388	.2810	.8949	95	6693	212	1401	54	1455	1626	6638	23619	.06884
B	.0389	.2806	.8947	95	6815	212	1594	62	1656	1850	6752	24065	.07690
B14A	.0385	.2828	.8959	95	6789	212	1197	46	1243	1387	6742	23838	.05820
B	.0389	.2801	.8945	95	6806	212	1217	47	1264	1413	6758	24121	.05860
B17A	.0388	.2807	.8948	95	6720	212	863	33	896	1001	6686	23816	.04206
B	.0385	.2829	.8960	95	6816	212	787	30	817	912	6785	23982	.03803
B19A	.0410	.2676	.8876	95	6338	212	499	20	519	585	6317	23600	.02479
B	.0398	.2746	.8914	95	6523	212	537	21	558	626	6501	23671	.02646
B23A	.0385	.2830	.8960	95	6581	212	110	4	114	127	6576	23235	.00548
B	.0384	.2833	.8962	95	6559	212	112	4	116	129	6554	23133	.00560
B25A	.0386	.2822	.8956	95	6484	212	43	1	44	49	6482	22970	.00217
B	.0383	.2843	.8967	95	6409	212	55	2	57	63	6406	22534	.00282

Table 2 (Cont.)

Kenwood Plant 6/25/71 Sta. B 5 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
.	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B27A	.0388	.2807	.8948	95	6468	212	18		18	20	6467	23033	.00090
B	.0391	.2788	.8938	95	6480	212	9		9	10	6479	23234	.00045
B28A	.0393	.2781	.8934	95	6345	212	10		10	11	6344	22807	.00051
B	.0387	.2818	.8954	95	6443	212					6443	22863	.00000
B29A	.0381	.2849	.8971	95	6071	212	-5	-	-5	-5	6071	21303	-.00027
B	.0385	.2828	.8959	95	6420	212	-10	-	-10	-11	6420	22702	-.00051
B30A	.0392	.2783	.8935	95	6167	212	-8	-	-8	-9	6167	22154	-.00042
B	.0391	.2789	.8938	95	6379	212	-4	-	-4	-4	6379	22871	-.00020

Table 2 (Cont.)

Kenwood Plant 7/2/71 Sta. A 5 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A01A	.0389	.2804	.8946	258	-4	205	2		2	2	-4	-14	-.15974
B	.0389	.2804	.8946	258	-14	205	7		7	8	-14	-50	-.15972
A02A	.0387	.2816	.8953	258	1409	205	546	21	567	633	1387	4927	.12854
B	.0386	.2819	.8954	258	1458	205	583	22	605	676	1435	5091	.13282
A03A	.0387	.2815	.8952	258	4408	205	1638	63	1701	1900	4344	15429	.12317
B	.0390	.2798	.8943	258	4443	205	1690	65	1755	1963	4377	15642	.12552
A04A	.0386	.2818	.8954	258	5926	205	1991	77	2068	2309	5848	20749	.11130
B	.0392	.2783	.8935	258	5904	205	2062	80	2142	2398	5823	20918	.11465
A05A	.0386	.2818	.8954	258	6654	205	2088	80	2168	2422	6573	23319	.10386
B	.0386	.2819	.8954	258	6670	205	1995	77	2072	2314	6592	23385	.09895
A07A	.0386	.2824	.8957	258	6820	205	1871	72	1943	2169	6747	23892	.09079
B	.0386	.2823	.8956	258	6828	205	1898	73	1971	2200	6754	23926	.09198
A09A	.0393	.2781	.8934	258	6802	205	1280	50	1330	1488	6751	24269	.06135
B	.0390	.2799	.8943	258	6850	205	1220	47	1267	1417	6802	24302	.05831
A11A	.0387	.2812	.8951	258	6707	205	866	33	899	1005	6673	23725	.04235
B	.0385	.2824	.8957	258	6828	205	873	33	906	1012	6794	24052	.04208
A13A	.0391	.2792	.8939	258	6629	205	609	23	632	707	6605	23653	.02992
B	.0388	.2807	.8948	258	6739	205	580	22	602	673	6716	23919	.02815
A15A	.0386	.2822	.8956	258	6698	205	372	14	386	431	6673	23640	.01824
B	.0390	.2798	.8943	258	6641	205	369	14	383	428	6626	23679	.01810
A17A	.0389	.2802	.8945	258	6598	205	265	10	275	307	6587	23506	.01309
B	.0387	.2817	.8953	258	6703	205	247	9	256	286	6693	23773	.01205
A19A	.0389	.2803	.8945	258	6629	205	179	6	185	207	6622	23623	.00880
B	.0390	.2794	.8941	258	6634	205	153	5	158	177	6628	23718	.00749
A21A	.0392	.2785	.8936	258	6548	205	121	4	125	140	6543	23487	.00599
B	.0378	.2872	.8983	258	6681	205	145	5	150	167	6675	23238	.00720

Table 2 (Cont.)

Kenwood Plant 7/2/71 Sta. A 5 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A23A	.0389	.2800	.8944	258	6624	205	89	3	92	103	6620	23637	.00437
B	.0389	.2801	.8944	258	6653	205	92	3	95	106	6649	23736	.00450
A25A	.0386	.2824	.8957	258	6463	205	61	2	63	70	6465	22890	.00308
B	.0390	.2798	.8943	258	6533	205	62	2	64	72	6530	23335	.00308

Table 2 (Cont.)

Kenwood Plant 7/2/71 Sta. B 5 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_H^3	e_{Kr}^{85}	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B01A	.0386	.2823	.8956	258	3	205	-6	-	-6	-6	3	11	-.60784
B	.0379	.2861	.8977	258	-10	205					-10	-34	.00000
B02A	.0389	.2802	.8945	258	11987	205	4720	183	4903	5482	11803	42123	.13014
B	.0390	.2797	.8942	258	12054	205	4754	185	4939	5523	11868	42431	.13018
B03A	.0382	.2844	.8968	258	8857	205	3215	123	3338	3721	8733	30702	.12122
B	.0382	.2845	.8968	258	8794	205	3166	121	3287	3665	8672	30480	.12024
B04A	.0390	.2796	.8942	258	7715	205	2674	104	2778	3107	7610	27213	.11417
B	.0385	.2830	.8960	258	7645	205	2613	100	2713	3028	7544	26651	.11362
B05A	.0384	.2832	.8961	258	7074	205	2253	86	2339	2610	6987	24667	.10583
B	.0382	.2846	.8969	258	6991	205	2318	88	2406	2683	6902	24245	.11066
B07A	.0382	.2843	.8967	258	6910	205	1904	72	1976	2204	6837	24045	.09167
B	.0381	.2852	.8972	258	6899	205	1912	72	1984	2212	6826	23931	.09243
B09A	.0384	.2834	.8962	258	6753	205	1236	47	1283	1432	6705	23657	.06053
B	.0383	.2842	.8967	258	6887	205	1269	48	1317	1469	6838	24054	.06108
B11A	.0387	.2818	.8954	258	6773	205	831	32	863	963	6740	23915	.04030
B	.0384	.2832	.8961	258	6805	205	816	31	847	945	6773	23914	.03953
C	.0384	.2834	.8963	258	6800	205	852	32	884	987	6767	23870	.04135
B13A	.0388	.2810	.8950	258	6771	205	579	22	601	672	6748	24009	.02799
B	.0377	.2873	.8984	258	6807	205	558	21	579	644	6785	23611	.02729
B15A	.0387	.2814	.8952	258	6653	205	361	13	374	418	6639	23585	.01776
B	.0382	.2845	.8969	258	6846	205	381	14	395	441	6831	24004	.01837
B17A	.0374	.2893	.8995	258	6715	205	257	9	266	296	6705	23173	.01279
B	.0380	.2855	.8974	258	6678	205	241	9	250	278	6668	23354	.01193

Table 2 (Cont.)

Kenwood Plant 7/2/71 Sta. B 5 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B19A	.0379	.2862	.8978	258	6741	205	156	5	161	180	6735	23530	.00766
B	.0380	.2855	.8974	258	6693	205	182	6	188	210	6686	23413	.00899
B21A	.0382	.2844	.8968	258	6622	205	123	4	127	142	6617	23261	.00612
B	.0381	.2854	.8973	258	6674	205	117	4	121	135	6669	23364	.00579
B23A	.0387	.2814	.8952	258	6585	205	99	3	102	114	6581	23382	.00491
B	.0384	.2835	.8963	258	6634	205	80	3	83	92	6630	23388	.00396
B25A	.0384	.2832	.8961	258	6613	205	71	2	73	82	6610	23338	.00352
B	.0385	.2826	.8958	258	6604	205	61	2	63	70	6601	23357	.00302

Table 2 (Cont.)

Kenwood Plant 7/9/71 Sta A 5 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.			Krypton-85		Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A01A	.0391	.2792	.8939	261	758	201	338	13	351	392	744	2667	.14730
B	.0385	.2829	.8960	261	715	201	333	12	345	385	702	2481	.15554
A02A	.0390	.2796	.8942	261	3674	201	1579	61	1640	1834	3612	12918	.14202
B	.0391	.2791	.8939	261	3716	201	1610	63	1673	1871	3652	13084	.14302
A03A	.0392	.2782	.8934	261	5413	201	2184	85	2269	2540	5327	19147	.13268
B	.0394	.2771	.8928	261	5422	201	2174	85	2259	2531	5336	19254	.13145
A04A	.0392	.2784	.8935	261	6491	201	2440	95	2535	2837	6395	22967	.12355
B	.0391	.2793	.8940	261	6588	201	2416	94	2510	2807	6493	23244	.12080
A05A	.0388	.2807	.8948	261	6905	201	2382	92	2474	2765	6812	24264	.11397
B	.0389	.2802	.8945	261	6864	201	2453	95	2548	2848	6768	24147	.11797
A07A	.0390	.2799	.8943	261	6933	201	1940	75	2015	2253	6857	24495	.09200
B	.0391	.2792	.8939	261	6824	201	1935	75	2010	2249	6748	24166	.09306
A08A	.0389	.2802	.8945	261	6852	201	1421	55	1476	1650	6796	24249	.06805
B	.0392	.2783	.8934	261	6813	201	1500	58	1558	1744	6754	24268	.07189
A10A	.0396	.2763	.8923	261	6659	201	970	38	1008	1130	6620	23960	.04716
B	.0392	.2787	.8937	261	6832	201	1051	41	1092	1222	6790	24363	.05016
A12A	.0388	.2811	.8950	261	6785	201	637	24	661	739	6760	24043	.03074
B	.0392	.2787	.8937	261	6769	201	666	26	692	774	6742	24193	.03201
A14A	.0390	.2799	.8943	261	6777	201	437	17	454	507	6759	24145	.02102
B	.0385	.2826	.8958	261	6767	201	446	17	463	517	6749	23878	.02165
A16A	.0391	.2790	.8938	261	6689	201	280	10	290	325	6678	23930	.01360
B	.0387	.2812	.8951	261	6716	201	272	10	282	315	6705	23840	.01324
A18A	.0393	.2775	.8930	261	6724	201	192	7	199	223	6716	24194	.00923
B	.0384	.2832	.8961	261	6761	201	196	7	203	227	6753	23846	.00952

Table 2 (Cont.)

Kenwood Plant 7/9/71 Sta. B 5 min counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	$e_H{}^3$	$e_{Kr}{}^{85}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B01A	.0385	.2825	.8958	261	2480	201	997	38	1035	1155	2441	8639	.13378
B	.0389	.2805	.8947	261	2534	201	994	38	1032	1154	2495	8894	.12976
B02A	.0390	.2799	.8943	261	8335	201	3534	137	3671	4105	8197	29281	.14020
B	.0381	.2850	.8971	261	8475	201	3538	135	3673	4094	8339	29258	.13992
C	.0382	.2849	.8970	261	8425	201	3564	136	3700	4124	8288	29092	.14177
B03A	.0385	.2827	.8958	261	8054	201	3089	119	3208	3580	7934	28067	.12758
B	.0388	.2806	.8947	261	8037	201	3188	124	3312	3701	7912	28194	.13128
B04A	.0388	.2809	.8949	261	7510	201	2773	107	2880	3218	7402	26347	.12217
B	.0384	.2832	.8961	261	7520	201	2661	102	2763	3083	7417	26189	.11773
B05A	.0387	.2812	.8951	261	7143	201	2453	95	2548	2846	7047	25058	.11360
B	.0385	.2829	.8960	261	7095	201	2425	93	2518	2810	7001	24745	.11358
B07A	.0389	.2800	.8944	261	6948	201	1963	76	2039	2280	6871	24537	.09293
B	.0383	.2841	.8966	261	6872	201	1956	74	2030	2264	6797	23919	.09468
B08A	.0388	.2808	.8948	261	6871	201	1515	58	1573	1758	6812	24258	.07250
B	.0390	.2795	.8941	261	6889	201	1568	61	1629	1822	6827	24426	.07459
B10A	.0390	.2799	.8944	261	6714	201	1043	40	1083	1211	6673	23835	.05083
B	.0394	.2774	.8929	261	6766	201	1035	40	1075	1204	6725	24242	.04969
B12A	.0390	.2797	.8942	261	6692	201	662	25	687	769	6666	23828	.03227
B	.0390	.2798	.8943	261	6759	201	662	25	687	769	6733	24061	.03196
B14A	.0389	.2805	.8947	261	6770	201	441	17	458	512	6752	24071	.02127
B	.0389	.2801	.8944	261	6712	201	429	16	445	498	6695	23903	.02084
B16A	.0387	.2812	.8951	261	6695	201	275	10	285	319	6684	23764	.01342
B	.0391	.2790	.8939	261	6684	201	283	11	294	328	6672	23910	.01375
B18A	.0388	.2810	.8949	261	6884	201	171	6	177	198	6877	24471	.00811
B	.0384	.2834	.8963	261	6702	201	202	7	209	234	6694	23613	.00991

Table 2 (Cont.)

South Cobb Plant 7/15/71 Sta. A 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_H^3	e_{Kr}^{85}	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A01A	.0384	.2831	.8961	183	8386	423	3536	136	3672	4097	8249	29133	.14064
B	.0390	.2795	.8941	183	8407	423	3523	137	3660	4093	8269	29577	.13841
A02A	.0389	.2803	.8945	183	5756	423	1960	76	2036	2276	5679	20259	.11235
B	.0394	.2774	.8929	183	5835	423	1997	78	2075	2324	5756	20750	.11202
A03A	.0388	.2810	.8949	183	4311	423	1259	48	1307	1461	4262	15167	.09635
B	.0393	.2779	.8932	183	4461	423	1243	48	1291	1446	4412	15873	.09110
A04A	.0392	.2786	.8936	183	3793	423	861	33	894	1001	3759	13489	.07422
B	.0383	.2838	.8964	183	3833	423	884	33	917	1023	3799	13386	.07649
A05A	.0383	.2842	.8967	183	3461	423	651	24	675	753	3436	12089	.06235
B	.0388	.2809	.8949	183	3466	423	612	23	635	710	3442	12250	.05798
A06A	.0386	.2820	.8955	183	3165	423	445	17	462	516	3147	11160	.04624
B	.0381	.2853	.8973	183	3140	423	492	18	510	569	3121	10936	.05204
A08A	.0386	.2820	.8955	183	2763	423	274	10	284	317	2752	9758	.03256
B	.0383	.2842	.8967	183	2726	423	244	9	253	282	2716	9555	.02956
A10A	.0390	.2797	.8942	183	2514	423	152	5	157	176	2508	8966	.01969
B	.0386	.2823	.8957	183	2582	423	137	5	142	158	2576	9125	.01740
A12A	.0381	.2850	.8971	183	2437	423	113	4	117	130	2432	8534	.01532
B	.0384	.2830	.8961	183	2493	423	94	3	97	103	2489	8793	.01238
A14A	.0388	.2810	.8950	183	2383	423	74	2	76	85	2380	8467	.01014
B	.0388	.2806	.8947	183	2388	423	49	1	50	56	2386	8501	.00669

Table 2 (Cont.)

South Cobb Plant 7/15/71 Sta. B 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B01A	.0382	.2845	.8969	183	5006	423	2142	81	2223	2479	4924	17304	.14329
B	.0386	.2822	.8956	183	5010	423	2097	81	2178	2431	4928	17461	.13926
B02A	.0384	.2836	.8964	183	4312	423	1473	56	1529	1706	4255	15002	.11373
B	.0393	.2781	.8933	183	4263	423	1435	56	1491	1669	4206	15124	.11037
B03A	.0388	.2809	.8949	183	3906	423	1058	41	1099	1228	3864	13754	.08928
B	.0387	.2817	.8953	183	3912	423	1079	41	1120	1251	3870	13734	.09113
B04A	.0385	.2829	.8960	183	3119	423	683	26	709	791	3092	10930	.07242
B	.0387	.2816	.8953	183	3155	423	645	24	669	748	3130	11112	.06734
B05A	.0387	.2813	.8951	183	3279	423	582	22	604	675	3256	11572	.05835
B	.0391	.2794	.8940	183	3212	423	582	22	604	676	3189	11414	.05925
B06A	.0392	.2786	.8936	183	2974	423	412	16	428	479	2957	10616	.04513
B	.0384	.2835	.8963	183	3104	423	447	17	464	517	3086	10886	.04756
B07A	.0387	.2812	.8950	183	2810	423	337	13	350	391	2796	9944	.03932
B	.0387	.2817	.8953	183	2976	423	341	13	354	395	2962	10515	.03761
B08A	.0389	.2803	.8946	183	2760	423	246	9	255	285	2750	9809	.02912
B	.0386	.2823	.8956	183	2735	423	234	9	243	271	2725	9655	.02810
B09A	.0387	.2814	.8952	183	2697	423	192	7	199	222	2689	9555	.02331
B	.0381	.2849	.8971	183	2714	423	230	8	238	266	2705	9493	.02803
B10A	.0388	.2809	.8949	183	2550	423	148	5	153	171	2544	9054	.01897
B	.0387	.2813	.8951	183	2616	423	120	4	124	139	2611	9282	.01500

Table 2 (Cont.)

South Cobb Plant 7/15/71 Sta. C 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
C01A	.0384	.2833	.8962	183	181	423	42	1	43	48	179	632	.07687
B	.0386	.2819	.8954	183	187	423	53	2	55	61	184	656	.09370
C02A	.0390	.2796	.8942	183	963	423	220	8	228	255	954	3412	.07490
B	.0389	.2802	.8945	183	876	423	242	9	251	281	866	3092	.09089
C03A	.0385	.2828	.8959	183	1512	423	304	11	315	352	1500	5304	.06643
B	.0387	.2815	.8952	183	1545	423	318	12	330	368	1532	5444	.06777
C04A	.0384	.2832	.8961	183	1779	423	270	10	280	312	1768	6244	.05010
B	.0335	.2829	.8960	183	1745	423	275	10	285	318	1734	6129	.05199
C05A	.0391	.2788	.8937	183	1975	423	239	9	248	277	1965	7049	.03941
B	.0386	.2822	.8956	183	2012	423	257	9	266	298	2002	7093	.04201
C06A	.0388	.2810	.8949	183	2196	423	191	7	198	221	2188	7787	.02846
B	.0388	.2811	.8950	183	2154	423	220	8	228	255	2145	7631	.03345
C07A	.0390	.2799	.8943	183	2505	423	187	7	194	217	2497	8921	.02434
B	.0387	.2817	.8953	183	2403	423	196	7	203	227	2395	8501	.02674
C08A	.0388	.2810	.8949	183	2446	423	140	5	145	162	2440	8683	.01871
B	.0393	.2779	.8933	183	2406	423	142	5	147	165	2400	8634	.01913
C09A	.0385	.2825	.8953	183	2458	423	135	5	140	156	2452	8679	.01803
B	.0379	.2862	.8978	183	2469	423	147	5	152	169	2463	8604	.01975

Table 2 (Cont.)

South Cobb Plant 7/22/71 Sta. A 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	$e_{H}{}^{3}$	$e_{Kr}{}^{85}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A01A	.0397	.2752	.8918	184	8928	419	4178	166	4344	4871	8761	31832	.15302
B	.0398	.2748	.8915	184	8977	419	4126	164	4290	4812	8812	32063	.15008
A02A	.0397	.2753	.8918	184	5895	419	2304	91	2395	2685	5803	21073	.12745
B	.0399	.2743	.8912	184	5999	419	2380	95	2475	2776	5903	21523	.12901
A03A	.0384	.2831	.8961	184	4061	419	1154	44	1198	1337	4016	14185	.09427
B	.0392	.2782	.8934	184	4083	419	1120	44	1164	1302	4038	14516	.08974
A04A	.0388	.2807	.8948	184	3469	419	764	29	793	886	3439	12249	.07240
B	.0393	.2775	.8930	184	3523	419	765	30	795	890	3492	12582	.07075
A05A	.0396	.2758	.8921	184	3136	419	609	24	633	709	3111	11279	.06292
B	.0389	.2802	.8945	184	3167	419	615	23	638	714	3143	11215	.06368
A06A	.0393	.2778	.8932	184	2930	419	403	15	418	468	2914	10489	.04470
B	.0397	.2754	.8919	184	2940	419	385	15	400	448	2924	10619	.04226
A07A	.0399	.2740	.8911	184	2780	419	284	11	295	331	2768	10103	.03280
B	.0397	.2755	.8919	184	2751	419	301	11	312	350	2739	9941	.03529
A08A	.0399	.2744	.8913	184	2639	419	222	8	230	258	2630	9583	.02702
B	.0395	.2763	.8924	184	2607	419	219	8	227	255	2598	9401	.02713
A09A	.0397	.2754	.8919	184	2476	419	199	7	206	231	2468	8961	.02588
B	.0397	.2755	.8919	184	2511	419	160	6	166	186	2504	9089	.02051
A10A	.0396	.2759	.8921	184	2466	419	122	4	126	142	2461	8919	.01593
B	.0397	.2752	.8918	184	2433	419	125	4	129	145	2428	8821	.01652

Table 2 (Cont.)

South Cobb Plant 7/22/71 Sta. B 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B01A	.0397	.2755	.8919	184	3820	419	1734	68	1802	2021	3751	13612	.14848
B	.0395	.2766	.8925	184	3834	419	1682	66	1748	1958	3767	13617	.14385
B02A	.0396	.2763	.8923	184	3580	419	1293	51	1344	1506	3528	12771	.11794
B	.0401	.2727	.8904	184	3533	419	1271	51	1322	1484	3481	12766	.11630
B03A	.0396	.2761	.8923	184	3715	419	1069	42	1111	1245	3672	13298	.09365
B	.0400	.2737	.8910	184	3699	419	1079	43	1122	1259	3655	13353	.09431
B04A	.0395	.2764	.8924	184	3269	419	780	30	810	908	3238	11715	.07755
B	.0396	.2762	.8923	184	3272	419	763	30	793	888	3241	11734	.07575
B05A	.0394	.2772	.8929	184	3048	419	555	21	576	646	3026	10913	.05919
B	.0394	.2773	.8929	184	3038	419	573	22	595	667	3015	10873	.06134
B06A	.0393	.2777	.8931	184	2893	419	419	16	435	487	2876	10357	.04707
B	.0395	.2769	.8927	184	2876	419	430	16	446	500	2859	10324	.04849
B07A	.0398	.2747	.8915	184	2713	419	305	12	317	355	2700	9829	.03619
B	.0395	.2763	.8924	184	2718	419	295	11	306	343	2706	9791	.03509
B08A	.0396	.2761	.8923	184	2569	419	233	9	242	271	2559	9268	.02928
B	.0390	.2794	.8941	184	2569	419	253	9	262	294	2559	9157	.03210
B09A	.0398	.2749	.8916	184	2545	419	182	7	189	212	2537	9229	.02299
B	.0399	.2740	.8911	184	2579	419	187	7	194	213	2571	9383	.02325
B10A	.0388	.2806	.8947	184	2490	419	143	5	148	166	2484	8850	.01875
B	.0397	.2752	.8917	184	2500	419	161	6	167	187	2493	9060	.02071

Table 2 (Cont.)

South Cobb Plant 7/22/71 Sta. D 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
D01A	.0397	.2752	.8917	184	338	419	117	4	121	136	333	1211	.11262
B	.0396	.2763	.8923	184	309	419	120	4	124	139	304	1101	.12695
D02A	.0397	.2755	.8919	184	1881	419	664	26	690	773	1854	6729	.11500
B	.0392	.2782	.8934	184	1853	419	657	25	682	764	1827	6566	.11639
D03A	.0388	.2811	.8950	184	2197	419	628	24	652	728	2172	7726	.09433
B	.0396	.2759	.8922	184	2203	419	556	22	578	647	2180	7902	.08198
D04A	.0393	.2781	.8933	184	2553	419	590	23	613	686	2529	9095	.07546
B	.0393	.2776	.8931	184	2588	419	593	23	616	690	2564	9238	.07470
D05A	.0394	.2775	.8930	184	2421	419	440	17	457	512	2403	8660	.05913
B	.0396	.2759	.8922	184	2448	419	445	17	462	518	2430	8806	.05888
D06A	.0396	.2758	.8921	184	2383	419	340	13	353	396	2369	8588	.04613
B	.0395	.2767	.8926	184	2453	419	336	13	349	391	2439	8814	.04439
D07A	.0397	.2752	.8917	184	2474	419	292	11	303	340	2462	8947	.03805
B	.0397	.2753	.8918	184	2434	419	295	11	306	343	2422	8796	.03909
D08A	.0399	.2744	.8913	184	2464	419	216	8	224	252	2455	8947	.02816
B	.0396	.2761	.8923	184	2505	419	210	8	218	244	2496	9039	.02706
D09A	.0392	.2782	.8934	184	2482	419	185	7	192	215	2474	8892	.02419
B	.0396	.2757	.8921	184	2431	419	194	7	201	226	2423	8787	.02573
D10A	.0397	.2754	.8919	184	2425	419	134	5	139	156	2419	8735	.01778
B	.0392	.2786	.8936	184	2466	419	158	6	164	183	2459	8826	.02081

Table 2 (Cont.)

South Cobb Plant 7/22/71 Sta. E 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.			Krypton-85		Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
E01A	.0397	.2754	.8919	184	-5	419	-4	-	-4	-4	-4	-17	.26530
B	.0393	.2777	.8931	184	10	419	-8	-	-8	-9	10	37	-.25068
E02A	.0391	.2789	.8938	184	347	419	107	4	111	124	342	1228	.10123
B	.0400	.2733	.8907	184	344	419	103	4	107	120	339	1243	.09671
E03A	.0397	.2757	.8920	184	1030	419	265	10	275	308	1019	3697	.08352
B	.0399	.2741	.8912	184	1049	419	277	11	288	323	1037	3785	.08538
E04A	.0389	.2800	.8944	184	1591	419	333	12	345	386	1578	5634	.06864
B	.0397	.2755	.8919	184	1605	419	314	12	326	366	1592	5778	.06333
E05A	.0386	.2820	.8955	184	1941	419	321	12	333	372	1928	6838	.05444
B	.0384	.2833	.8962	184	1973	419	344	13	357	398	1959	6916	.05762
E06A	.0394	.2770	.8928	184	2085	419	285	11	296	331	2073	7484	.04433
B	.0393	.2776	.8931	184	2095	419	249	9	258	289	2085	7509	.03858
E07A	.0393	.2777	.8931	184	2255	419	237	9	246	275	2245	8034	.03411
B	.0396	.2760	.8922	184	2269	419	268	10	278	312	2258	8180	.03817
E08A	.0388	.2808	.8948	184	2337	419	183	7	190	212	2329	8295	.02560
B	.0398	.2750	.8917	184	2332	419	217	8	225	253	2323	8445	.02995
E09A	.0395	.2768	.8927	184	2394	419	158	6	164	183	2387	8623	.02133
B	.0394	.2772	.8928	184	2387	419	186	7	193	216	2379	8584	.02522
E10A	.0389	.2802	.8945	184	2481	419	139	5	144	161	2475	8834	.01827
B	.0395	.2769	.8927	184	2424	419	137	5	142	159	2418	8734	.01826

Table 2 (Cont.)

South Cobb Plant 8/4/71 Sta. A 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A01A	.0401	.2728	.8905	180	6301	423	2765	111	2876	3229	6189	22684	.14237
B	.0399	.2743	.8913	180	6209	423	2819	112	2931	3288	6096	22221	.14801
A02A	.0401	.2727	.8904	180	5315	423	2070	83	2153	2418	5231	19180	.12606
B	.0392	.2783	.8935	180	5356	423	2084	81	2165	2423	5274	18945	.12794
A03A	.0396	.2758	.8921	180	4306	423	1395	55	1450	1625	4250	15407	.10551
B	.0398	.2751	.8917	180	4210	423	1290	51	1341	1504	4158	15116	.09950
A04A	.0395	.2764	.8924	180	3744	423	991	39	1030	1154	3704	13402	.08613
B	.0398	.2745	.8914	180	3650	423	973	38	1011	1135	3611	13154	.08628
A05A	.0399	.2744	.8913	180	3215	423	693	27	720	808	3187	11613	.06961
B	.0397	.2751	.8917	180	3271	423	776	30	806	904	3240	11775	.07683
A06A	.0399	.2739	.8910	180	3030	423	534	21	555	623	3008	10984	.05674
B	.0399	.2741	.8912	180	3091	423	513	20	533	598	3070	11200	.05344
A07A	.0404	.2711	.8895	180	2858	423	419	16	435	490	2841	10476	.04677
B	.0400	.2735	.8908	180	2852	423	416	16	432	485	2835	10365	.04685
A08A	.0399	.2742	.8912	180	2813	423	315	12	327	367	2800	10211	.03599
B	.0399	.2744	.8913	180	2734	423	328	13	341	382	2720	9915	.03859
A09A	.0390	.2795	.8941	180	2658	423	246	9	255	285	2648	9473	.03017
B	.0404	.2711	.8895	180	2597	423	214	8	222	250	2588	9546	.02621
A10A	.0403	.2719	.8900	180	2516	423	144	5	149	168	2510	9229	.01823
B	.0401	.2730	.8906	180	2537	423	191	7	198	223	2529	9262	.02408
A11A	.0403	.2718	.8899	180	2404	423	152	6	158	177	2397	8820	.02014
B	.0401	.2730	.8905	180	2419	423	126	5	131	147	2413	8841	.01664

Table 2 (Cont.)

South Cobb Plant 8/4/71 Sta. B 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	$e_H{}^3$	$e_{Kr}{}^{85}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B01A	.0409	.2682	.8879	180	4316	423	1769	72	1841	2073	4243	15818	.13109
B	.0408	.2687	.8882	180	4303	423	1765	72	1837	2068	4230	15740	.13138
B02A	.0400	.2733	.8907	180	3798	423	1333	53	1386	1556	3744	13699	.11361
B	.0402	.2725	.8903	180	3797	423	1305	52	1357	1524	3744	13736	.11099
B03A	.0394	.2775	.8930	180	3679	423	1001	39	1040	1164	3639	13111	.08885
B	.0397	.2752	.8918	180	3612	423	1057	42	1099	1232	3569	12969	.09501
B04A	.0399	.2741	.8912	180	3353	423	727	29	756	848	3323	12124	.06996
B	.0396	.2757	.8920	180	3296	423	778	30	808	906	3265	11840	.07658
B05A	.0396	.2763	.8924	180	3077	423	602	23	625	701	3053	11048	.06347
B	.0395	.2769	.8927	180	3006	423	575	22	597	669	2983	10771	.06215
B06A	.0405	.2705	.8892	180	2851	423	456	18	474	533	2832	10471	.05096
B	.0394	.2770	.8927	180	2865	423	442	17	459	514	2847	10279	.05006
B07A	.0390	.2794	.8941	180	2745	423	349	13	362	405	2731	9773	.04149
B	.0394	.2772	.8929	180	2750	423	353	13	366	410	2736	9867	.04164
B08A	.0395	.2767	.8926	180	2709	423	254	10	264	295	2698	9751	.03033
B	.0399	.2740	.8911	180	2691	423	267	10	277	311	2680	9779	.03186
B09A	.0402	.2723	.8902	180	2603	423	136	5	141	158	2597	9537	.01666
B	.0393	.2776	.8931	180	2596	423	219	8	227	254	2587	9318	.02735
B10A	.0400	.2736	.8909	180	2540	423	149	5	154	173	2534	9259	.01878
B	.0403	.2719	.8899	180	2440	423	171	6	177	199	2433	8947	.02233

Table 2 (Cont.)

South Cobb Plant 8/4/71 Sta. D 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
D01A	.0400	.2732	.8907	180	12	423	-32	-1	-33	-37	13	48	-.76879
B	.0403	.2720	.8900	180	-5	423	-29	-1	-30	-33	-3	-14	2.40689
D02A	.0406	.2700	.8889	180	1629	423	658	26	684	770	1602	5932	.12983
B	.0407	.2694	.8886	180	1685	423	624	25	649	730	1659	6158	.11866
D03A	.0402	.2725	.8903	180	2284	423	738	29	767	862	2254	8270	.10425
B	.0398	.2746	.8914	180	2312	423	725	28	753	845	2283	8312	.10173
D04A	.0405	.2707	.8893	180	2498	423	654	26	630	765	2471	9129	.08381
B	.0397	.2756	.8920	180	2566	423	596	23	619	694	2542	9223	.07531
D05A	.0406	.2700	.8889	180	2456	423	498	20	518	582	2435	9018	.06463
B	.0405	.2705	.8892	180	2528	423	496	20	516	580	2507	9271	.06260
D06A	.0399	.2740	.8911	180	2410	423	424	16	440	494	2393	8732	.05666
B	.0399	.2740	.8911	180	2476	423	389	15	404	453	2460	8977	.05056
D07A	.0407	.2694	.8886	180	2510	423	312	12	324	365	2497	9266	.03942
B	.0391	.2788	.8937	180	2593	423	305	11	316	354	2581	9256	.03831
D08A	.0401	.2731	.8906	180	2399	423	262	10	272	305	2388	8744	.03499
B	.0400	.2738	.8910	180	2442	423	228	9	237	266	2432	8883	.02995
D09A	.0397	.2753	.8918	180	2534	423	230	9	239	268	2524	9168	.02924
B	.0399	.2739	.8910	180	2488	423	190	7	197	221	2480	9055	.02448
D10A	.0393	.2781	.8934	180	2465	423	149	5	154	173	2459	8840	.01960
B	.0406	.2700	.8889	180	2465	423	135	5	140	158	2459	9107	.01735
D11A	.0402	.2725	.8903	180	2467	423	142	5	147	165	2461	9029	.01837
B	.0398	.2751	.8917	180	2497	423	131	5	136	152	2491	9057	.01686

Table 2 (Cont.)

South Cobb Plant 8/4/71 Sta. E 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{-5}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
E01A	.0406	.2699	.8889	180	18	423	-7	-	-7	-8	18	67	-.12099
B	.0406	.2697	.8887	180	45	423	2		2	2	44	166	.01406
E02A	.0407	.2690	.8884	180	645	423	210	8	218	246	636	2365	.10401
B	.0402	.2722	.8901	180	672	423	212	8	220	247	663	2437	.10165
E03A	.0400	.2737	.8909	180	1117	423	280	11	291	326	1105	4039	.08091
B	.0408	.2685	.8881	180	1060	423	263	10	273	308	1049	3906	.07889
E04A	.0406	.2700	.8889	180	1582	423	359	14	373	420	1567	5803	.07241
B	.0406	.2698	.8888	180	1627	423	350	14	364	409	1612	5976	.06856
E05A	.0405	.2706	.8892	180	1975	423	301	12	313	352	1962	7252	.04856
B	.0404	.2709	.8894	180	1941	423	315	12	327	368	1928	7115	.05178
E06A	.0404	.2712	.8896	180	2072	423	269	10	279	314	2061	7597	.04140
B	.0404	.2713	.8897	180	2069	423	278	11	289	325	2057	7582	.04287
E07A	.0411	.2670	.8873	180	2286	423	275	11	286	322	2274	8518	.03787
B	.0403	.2714	.8897	180	2246	423	246	9	255	287	2236	8236	.03492
E08A	.0402	.2722	.8901	180	2370	423	185	7	192	216	2362	8678	.02491
B	.0406	.2697	.8888	180	2357	423	173	7	180	202	2349	8711	.02325
E09A	.0403	.2714	.8897	180	2526	423	170	6	176	198	2519	9280	.02142
B	.0400	.2735	.8908	180	2447	423	140	5	145	163	2441	8925	.01831
E10A	.0406	.2701	.8890	180	2353	423	106	4	110	124	2348	8693	.01427
B	.0405	.2707	.8893	180	2420	423	132	5	137	154	2414	8919	.01731
E11A	.0404	.2712	.8896	180	2488	423	78	3	81	91	2484	9159	.00995
B	.0404	.2712	.8896	180	2485	423	93	3	96	108	2481	9148	.01188
E12A	.0401	.2730	.8906	180	2452	423	95	3	98	110	2448	8964	.01237
B	.0404	.2710	.8895	180	2448	423	98	3	101	114	2444	9015	.01271

Table 2 (Cont.)

South River Plant (I) 8/16/71 Sta. A 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A01A	.0419	.2618	.8845	183	4845	406	2441	102	2543	2875	4742	18108	.15879
B	.0419	.2617	.3844	183	4815	406	2327	97	2424	2741	4717	18023	.15211
A02A	.0420	.2613	.8842	183	3493	406	1551	65	1616	1827	3427	13116	.13935
B	.0423	.2592	.8830	183	3459	406	1560	66	1626	1841	3392	13086	.14071
A03A	.0421	.2609	.8840	183	2922	406	1146	48	1194	1350	2873	11011	.12268
B	.0417	.2632	.8852	183	2929	406	1161	48	1209	1366	2880	10942	.12485
A04A	.0423	.2594	.8831	183	2423	406	865	36	901	1020	2386	9197	.11100
B	.0419	.2621	.8846	183	2451	406	870	36	906	1024	2414	9209	.11126
A05A	.0423	.2595	.8832	183	2237	406	646	27	673	762	2209	8514	.08954
B	.0420	.2616	.8843	183	2239	406	676	28	704	796	2210	8450	.09425
A06A	.0421	.2608	.8839	183	1998	406	531	22	553	626	1975	7573	.08266
B	.0415	.2646	.8860	183	2043	406	563	23	586	661	2019	7631	.08671
A07A	.0418	.2628	.8850	183	1788	406	437	18	455	514	1769	6733	.07639
B	.0424	.2589	.8828	183	1792	406	406	17	423	479	1774	6854	.06993
A08A	.0417	.2634	.8853	183	1829	406	410	17	427	482	1811	6876	.07014
B	.0418	.2626	.8848	183	1905	406	412	17	429	485	1887	7188	.06747
A09A	.0418	.2623	.8847	183	1691	406	336	14	350	395	1676	6392	.06189
B	.0418	.2625	.8848	183	1728	406	295	12	307	347	1715	6535	.05314
A10A	.0418	.2628	.8850	183	1651	406	304	12	316	357	1638	6233	.05740
B	.0421	.2607	.8838	183	1623	406	270	11	281	318	1611	6180	.05151
A11A	.0422	.2603	.8836	183	1611	406	206	8	214	242	1602	6153	.03948
B	.0422	.2601	.8835	183	1614	406	256	10	266	301	1603	6161	.04900
A12A	.0424	.2591	.8830	183	1541	406	209	8	217	246	1532	5912	.04173
B	.0417	.2629	.8851	183	1595	406	202	8	210	237	1586	6033	.03940
A13A	.0418	.2626	.8849	183	1541	406	195	8	203	229	1532	5835	.03934
B	.0420	.2616	.8843	183	1488	406	183	7	190	215	1480	5657	.03810

Table 2 (Cont.)

South River Plant (I) 8/16/71 Sta. B 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
B01A	.0420	.2613	.8842	183	3260	406	1479	62	1541	1742	3197	12233	.14247
B	.0420	.2613	.8842	183	3170	406	1532	64	1596	1805	3105	11882	.15194
B02A	.0421	.2606	.8838	183	3364	406	1394	58	1452	1643	3305	12679	.12963
B	.0422	.2601	.8835	183	3235	406	1407	59	1466	1659	3175	12205	.13597
B03A	.0417	.2634	.8853	183	2749	406	1048	43	1091	1233	2705	10269	.12007
B	.0420	.2613	.8842	183	2727	406	992	41	1033	1169	2685	10274	.11378
B04A	.0428	.2564	.8815	183	2458	406	774	33	807	915	2424	9455	.09684
B	.0422	.2601	.8835	183	2484	406	850	35	885	1002	2448	9410	.10654
B05A	.0422	.2601	.8835	183	2306	406	636	26	662	750	2279	8759	.08564
B	.0418	.2624	.8848	183	2245	406	622	26	648	732	2218	8453	.08663
B06A	.0419	.2622	.8846	183	2181	406	528	22	550	621	2158	8232	.07553
B	.0423	.2597	.8833	183	2165	406	561	23	584	661	2141	8242	.08031
B07A	.0421	.2607	.8838	183	2011	406	460	19	479	542	1991	7637	.07101
B	.0419	.2617	.8844	183	1985	406	472	19	491	556	1965	7506	.07407
B08A	.0423	.2597	.8833	183	1875	406	367	15	382	433	1859	7159	.06048
B	.0420	.2613	.8841	183	1846	406	397	16	413	467	1829	7000	.06683
B09A	.0420	.2613	.8842	183	1799	406	329	13	342	387	1785	6829	.05677
B	.0421	.2609	.8839	183	1843	406	339	14	353	399	1828	7009	.05701
B10A	.0420	.2613	.8842	183	1744	406	272	11	283	320	1732	6628	.04835
B	.0421	.2607	.8838	183	1698	406	254	10	264	299	1687	6470	.04628
B11A	.0423	.2592	.8830	183	1693	406	243	10	253	286	1682	6490	.04419
B	.0422	.2601	.8835	183	1754	406	250	10	260	294	1743	6702	.04400
B12A	.0422	.2603	.8836	183	1630	406	189	7	196	222	1622	6231	.03577

Table 2 (Cont.)

South River Plant (I) 8/16/71 Sta. C 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
C01A	.0418	.2623	.8847	183	227	406	135	5	140	158	221	843	.18842
B	.0420	.2613	.8842	183	242	406	154	6	160	181	235	901	.20141
C02A	.0427	.2572	.8819	183	695	406	298	12	310	352	682	2652	.13282
B	.0421	.2608	.8839	183	682	406	340	14	354	400	667	2559	.15659
C03A	.0416	.2635	.8854	183	1673	406	709	29	738	834	1643	6236	.13375
B	.0423	.2596	.8832	183	1636	406	701	29	730	827	1606	6186	.13372
C04A	.0417	.2630	.8851	183	2025	406	790	32	822	929	1992	7571	.12279
B	.0419	.2622	.8846	183	2033	406	768	32	800	904	2000	7629	.11854
C05A	.0415	.2641	.8857	183	2249	406	813	33	846	956	2215	8386	.11400
B	.0418	.2625	.8848	183	2291	406	805	33	838	947	2257	8598	.11023
C06A	.0419	.2617	.8844	183	2321	406	731	30	761	861	2290	8749	.09842
B	.0416	.2636	.8854	183	2314	406	707	29	736	831	2284	8665	.09598
C07A	.0420	.2614	.8842	183	2318	406	592	24	616	697	2293	8771	.07953
B	.0420	.2615	.8843	183	2248	406	595	25	620	701	2222	8499	.08248
C08A	.0419	.2621	.8846	183	2219	406	514	21	535	605	2197	8381	.07222
B	.0418	.2626	.8849	183	2179	406	543	22	565	639	2156	8208	.07787
C09A	.0419	.2617	.8844	183	2156	406	403	16	419	474	2139	8171	.05810
B	.0420	.2615	.8843	183	2087	406	458	19	477	539	2067	7905	.06826
C10A	.0415	.2643	.8858	183	2018	406	386	16	402	453	2001	7572	.05992
B	.0422	.2600	.8835	183	2036	406	362	15	377	427	2020	7770	.05495
C11A	.0413	.2655	.8865	183	1930	406	344	14	358	404	1915	7213	.05601
B	.0417	.2632	.8852	183	1967	406	338	14	352	397	1952	7417	.05362
C12A	.0416	.2637	.8855	183	1913	406	288	11	299	338	1901	7208	.04700
B	.0418	.2624	.8848	183	1875	406	293	12	305	345	1862	7097	.04861
C13A	.0426	.2575	.8821	183	1772	406	248	10	258	293	1761	6838	.04286
B	.0417	.2634	.8853	183	1802	406	260	10	270	305	1791	6798	.04499

Table 2 (Cont.)

South River Plant (II) 8/24/71 Sta. A 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
A01A	.0415	.2645	.8859	187	5069	426	2671	110	2781	3140	4958	18743	.16752
B	.0422	.2603	.8836	187	5014	426	2678	113	2791	3158	4900	18827	.16776
A02A	.0416	.2640	.8856	187	5155	426	2431	101	2532	2858	5053	19139	.14937
B	.0420	.2613	.8841	187	5158	426	2392	100	2492	2819	5057	19354	.14565
A03A	.0412	.2659	.8867	187	4198	426	1789	73	1862	2100	4124	15506	.13548
B	.0415	.2643	.8858	187	4201	426	1749	72	1821	2056	4128	15616	.13168
A04A	.0416	.2638	.8855	187	3567	426	1363	56	1419	1603	3510	13306	.12048
B	.0419	.2619	.8845	187	3627	426	1372	57	1429	1616	3569	13627	.11859
A05A	.0412	.2663	.8869	187	3123	426	1078	44	1122	1265	3078	11559	.10947
B	.0416	.2639	.8856	187	3164	426	1053	43	1096	1238	3120	11819	.10477
A06A	.0417	.2632	.8852	187	2777	426	824	34	858	969	2742	10417	.09307
B	.0418	.2622	.8847	187	2842	426	849	35	884	999	2806	10699	.09344
A07A	.0421	.2608	.8839	187	2279	426	635	26	661	748	2252	8634	.08670
B	.0416	.2637	.8855	187	2299	426	593	24	617	697	2274	8623	.08089
A08A	.0406	.2697	.8888	187	2300	426	561	22	583	656	2277	8441	.07781
B	.0408	.2688	.8883	187	2300	426	565	23	588	662	2276	8469	.07816
A09A	.0412	.2661	.8868	187	2084	426	470	19	489	551	2064	7757	.07113
B	.0412	.2659	.8867	187	2049	426	424	17	441	497	2031	7637	.06518
A10A	.0412	.2660	.8867	187	1787	426	339	13	352	398	1773	6664	.05973
B	.0410	.2675	.8876	187	1732	426	331	13	344	388	1718	6422	.06044
A11A	.0410	.2673	.8874	187	1781	426	306	12	318	358	1768	6615	.05426
B	.0409	.2683	.8880	187	1767	426	290	11	301	339	1755	6539	.05197
A12A	.0415	.2642	.8857	187	1582	426	263	10	273	309	1571	5945	.05201
B	.0417	.2633	.8852	187	1610	426	213	9	227	256	1600	6079	.04219
A13A	.0411	.2667	.8871	187	1455	426	191	7	198	224	1447	5424	.04132
B	.0412	.2661	.8868	187	1443	426	208	8	216	244	1434	5388	.04531

Table 2 (Cont.)

South River Plant (II) 8/24/71 Sta. D 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
D01A	.0414	.2648	.8861	187	524	426	262	10	272	307	513	1937	.15895
B	.0417	.2630	.8851	187	508	426	249	10	259	293	497	1891	.15492
D02A	.0417	.2631	.8852	187	1320	426	601	25	626	707	1294	4920	.14374
B	.0420	.2614	.8842	187	1321	426	608	25	633	716	1295	4954	.14461
D03A	.0419	.2617	.8844	187	2085	426	836	35	871	984	2049	7832	.12575
B	.0421	.2608	.8839	187	2008	426	788	33	821	929	1974	7571	.12270
D04A	.0417	.2630	.8851	187	2562	426	931	38	969	1095	2523	9590	.11425
B	.0420	.2610	.8840	187	2573	426	897	37	934	1057	2535	9710	.10888
D05A	.0412	.2662	.8868	187	2435	426	703	28	731	825	2406	9036	.09133
B	.0422	.2601	.8835	187	2374	426	708	29	737	835	2344	9010	.09268
D06A	.0423	.2597	.8833	187	2407	426	664	28	692	783	2378	9158	.08554
B	.0417	.2632	.8852	187	2458	426	700	29	729	823	2428	9227	.08927
D07A	.0418	.2623	.8847	187	2398	426	581	24	605	684	2373	9048	.07561
B	.0425	.2585	.8826	187	2401	426	606	25	631	715	2375	9187	.07790
D08A	.0423	.2595	.8832	187	2353	426	537	22	559	633	2330	8978	.07058
B	.0420	.2613	.8842	187	2311	426	593	24	617	698	2286	8747	.07989
D09A	.0413	.2653	.8864	187	2310	426	438	18	456	514	2291	8636	.05958
B	.0419	.2620	.8845	187	2267	426	413	17	430	486	2249	8585	.05666
D10A	.0421	.2609	.8839	187	2128	426	376	15	391	443	2112	8094	.05475
B	.0420	.2611	.8841	187	2102	426	346	14	360	407	2087	7992	.05102
D11A	.0421	.2606	.8838	187	2062	426	333	14	347	392	2047	7857	.04997
B	.0421	.2606	.8838	187	2111	426	369	15	384	435	2095	8038	.05412
D12A	.0420	.2612	.8841	187	2044	426	283	11	294	333	2032	7777	.04288
B	.0415	.2641	.8857	187	2058	426	301	12	313	353	2045	7742	.04571
D13A	.0420	.2615	.8843	187	1849	426	252	10	262	296	1838	7029	.04224
B	.0424	.2587	.8827	187	1866	426	237	10	247	279	1855	7173	.03901

Table 2 (Cont.)

South River Plant (II) 8/24/71 Sta. E 10 min. counts

Sample	Calibration Data			Tritium Ch.		Kr^{85} Ch.		Krypton-85			Tritium		Kr^{85}/H^3
	spill-over	e_{H^3}	$e_{Kr^{85}}$	B	Avg.-B	B	Avg.-B	in H^3	counts	events	counts	events	ratio
E01A	.0414	.2649	.8862	187	135	426	55	2	57	64	132	500	.12905
B	.0421	.2608	.8839	187	119	426	58	2	60	68	116	446	.15302
E02A	.0425	.2585	.8826	187	733	426	293	12	305	346	720	2786	.12417
B	.0413	.2657	.8866	187	702	426	293	12	305	344	689	2596	.13255
E03A	.0423	.2593	.8831	187	1325	426	527	22	549	622	1302	5021	.12386
B	.0425	.2584	.8826	187	1330	426	481	20	501	568	1309	5066	.11213
E04A	.0419	.2617	.8844	187	1678	426	600	25	625	706	1652	6314	.11195
B	.0421	.2607	.8838	187	1695	426	596	25	621	702	1669	6404	.10972
E05A	.0421	.2605	.8837	187	1869	426	589	24	613	694	1844	7077	.09813
B	.0419	.2618	.8844	187	1854	426	574	24	598	676	1829	6989	.09675
E06A	.0420	.2612	.8841	187	2008	426	534	22	556	629	1985	7599	.08281
B	.0414	.2649	.8861	187	2099	426	581	24	605	682	2074	7830	.08719
E07A	.0425	.2585	.8826	187	2106	426	552	23	575	651	2082	8054	.08094
B	.0421	.2608	.8839	187	2161	426	516	21	537	608	2139	8201	.07417
E08A	.0419	.2620	.8846	187	2184	426	503	21	524	592	2162	8252	.07179
B	.0413	.2654	.8864	187	2266	426	497	20	517	583	2245	8458	.06902
E09A	.0409	.2681	.8879	187	2321	426	466	19	485	546	2301	8583	.06364
B	.0422	.2601	.8835	187	2190	426	407	17	424	480	2172	8351	.05748
E10A	.0415	.2645	.8859	187	2285	426	379	15	394	445	2269	8577	.05194
B	.0421	.2604	.8837	187	2179	426	387	16	403	456	2162	8303	.05496
E11A	.0423	.2597	.8833	187	2205	426	356	15	371	420	2189	8430	.04982
B	.0419	.2616	.8843	187	2205	426	323	13	336	380	2191	8375	.04544
E12A	.0410	.2671	.8874	187	2098	426	264	10	274	309	2087	7811	.03965
B	.0422	.2601	.8835	187	2085	426	302	12	314	356	2072	7964	.04472

Table 3. Field Test Results

Kenwood Plant (6/25/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^3 ratio	
A01	3.02	1483	0.1195	
A03	5.00	1581	0.1178	
A05	9.00	4777	0.1069	
A07	12.58	4822	0.09158	
A11	18.83	4875	0.07603	$\alpha\ K_{kr}$ = 0.0368/min
A14	26.00	4836	0.05417	Corr. Coeff. = -0.999
A17	39.00	4835	0.03494	
A19	54.00	4770	0.02018	
B01	2.42	3856	0.1003	
B03	5.50	5378	0.09986	
B04	6.50	5224	0.09978	
B05	8.00	4996	0.1044	
B07	10.25	4943	0.08218	
B09	13.05	4837	0.07987	
B11	16.73	4768	0.07287	$\alpha\ K_{kr}$ = 0.0380/min
B14	21.25	4796	0.05840	Corr. Coeff = -0.999
B17	32.00	4780	0.04055	
B19	42.00	4727	0.02563	
B23	83.00	4637	0.00554	
B25	103.00	4550	0.00250	
B27	123.00	4627	0.00068	
B28	143.00	4567	0.00026	
B29	163.00	4401	-	
B30	183.00	4503	-	

Table 3. (Cont.)

Kenwood Plant (7/2/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^3 ratio	
A01	0.50	-	-	
A02	2.50	1002	0.1307	
A03	4.50	3107	0.1243	
A04	6.50	4167	0.1130	
A05	8.50	4670	0.1014	
A07	12.50	4782	0.09139	
A09	22.50	4857	0.05983	αK_{kr} = 0.0386/min
A11	32.50	4778	0.04222	Corr. Coeff. = -0.999
A13	42.50	4757	0.02904	
A15	52.50	4732	0.01817	
A17	62.50	4728	0.01257	
A19	72.50	4734	0.00815	
A21	82.50	4673	0.00660	
A23	92.50	4737	0.00444	
A25	102.50	4623	0.00308	
B01	0.50	-	-	
B02	2.50	8455	0.1302	
B03	4.50	6118	0.1207	
B04	6.50	5386	0.1139	
B05	8.50	4891	0.1082	
B07	12.50	4798	0.09205	
B09	22.50	4771	0.06081	αK_{kr} = 0.0393/min
B11	32.50	4780	0.04039	Corr. Coeff = -1.000
B13	42.50	4762	0.02764	
B15	52.50	4759	0.01807	
B17	62.50	4653	0.01236	
B19	72.50	4694	0.00833	
B21	82.50	4663	.00596	
B23	92.50	4677	.00444	
B25	102.50	4670	.00327	

Table 3. (Cont.)

Kenwood Plant (7/9/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^3 ratio	
A01	2.00	515	0.1514	
A02	4.00	2600	0.1425	
A03	6.00	3840	0.1321	
A04	8.00	4621	0.1222	
A05	10.00	4841	0.1160	
A07	15.00	4866	0.09252	αK_{kr} = 0.0417/min
A08	20.00	4852	0.06997	Corr. Coeff. = -1.000
A10	30.00	4832	0.04866	
A12	40.00	4824	0.03137	
A14	50.00	4802	0.02133	
A16	60.00	4777	0.01342	
A18	70.00	4804	0.00937	
B01	2.00	1753	0.1318	
B02	4.00	5842	0.1406	
B03	6.00	5626	0.1294	
B04	8.00	5254	0.1200	
B05	10.00	4980	0.1136	
B07	15.00	4846	0.09381	αK_{kr} = 0.0412/min
B08	20.00	4868	0.07355	Corr. Coeff = -0.999
B10	30.00	4808	0.05026	
B12	40.00	4789	0.03212	
B14	50.00	4797	0.02106	
B16	60.00	4767	0.01359	
B18	70.00	3808	0.00901	

Table 3. (Cont.)

South Cobb Plant (7/15/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^3 ratio	
A01	5.00	2936	0.1400	
A02	10.00	2050	0.1122	
A03	15.00	1552	0.09373	
A04	20.00	1344	0.07536	αK_{kr} = 0.0419/min
A05	25.00	1217	0.06017	Corr. Coeff = -1.000
A06	30.00	1105	0.04914	
A08	41.00	966	0.03106	
A10	50.00	905	0.01855	
A12	60.00	866	0.01385	
A14	70.00	848	0.00842	
B01	5.00	1738	0.1413	
B02	10.00	1506	0.1121	
B03	15.00	1374	0.09021	
B04	20.00	1102	0.06988	αK_{kr} = 0.0438/min
B05	25.00	1149	0.05880	Corr. Coeff. = -0.999
B06	30.00	1075	0.04635	
B07	35.00	1023	0.03847	
B08	41.00	973	0.02861	
B09	45.00	952	0.02567	
B10	50.00	917	0.01699	
C01	8.00	64	0.08529	
C02	13.00	325	0.08290	
C03	17.25	537	0.06710	αK_{kr} = 0.0485/min
C04	24.00	619	0.05105	Corr. Coeff. = -0.998
C05	28.00	707	0.04071	
C06	33.00	771	0.03096	
C07	38.00	871	0.02554	
C08	44.00	866	0.01892	
C09	48.00	864	0.01889	

Table 3. (Cont.)

South Cobb Plant (7/22/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^3 ratio	
A01	5.00	3195	0.1516	
A02	10.00	2130	0.1282	
A03	15.00	1435	0.09201	
A04	20.00	1242	0.07158	αK_{kr} = 0.0501/min
A05	25.00	1125	0.06330	Corr. Coeff = -0.997
A06	30.00	1055	0.04348	
A07	35.00	1002	0.03405	
A08	40.00	949	0.02708	
A09	46.00	903	0.02320	
A10	50.00	887	0.01623	
B01	5.00	1361	0.1462	
B02	10.00	1277	0.1171	
B03	15.00	1333	0.09398	
B04	20.00	1172	0.07665	αK_{kr} = 0.0456/min
B05	25.00	1089	0.06027	Corr. Coeff = -0.999
B06	30.00	1034	0.04778	
B07	35.00	981	0.03564	
B08	40.00	921	0.03069	
B09	45.00	931	0.02312	
B10	50.00	896	0.01973	
D01	5.00	116	0.1198	
D02	10.00	665	0.1157	
D03	15.00	781	0.08816	
D04	20.00	917	0.07508	αK_{kr} = 0.0461/min
D05	25.00	873	0.05901	Corr. Coeff. = -0.997
D06	30.00	870	0.04526	
D07	35.00	887	0.03857	
D08	40.00	899	0.02761	
D09	45.00	884	0.02496	
D10	50.00	881	0.01930	
E01	5.00	-	-	
E02	10.00	124	0.09897	
E03	15.00	374	0.08445	
E04	20.00	571	0.06599	αK_{kr} = 0.0433/min
E05	25.00	688	0.05603	Corr. Coeff. = -0.995
E06	30.00	750	0.04146	
E07	35.00	813	0.03614	
E08	40.00	837	0.02778	
E09	45.00	860	0.02328	
E10	50.00	878	0.01827	

Table 3. (Cont.)

South Cobb Plant (8/4/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^3 ratio	
A01	2.50	2245	0.1452	
A02	7.50	1906	0.1270	
A03	12.50	1526	0.1025	
A04	17.50	1328	0.08621	αK_{kr} = 0.0408/min.
A05	22.50	1169	0.07322	Corr. Coeff. = -0.997
A06	27.50	1109	0.05509	
A07	32.50	1042	0.04681	
A08	37.50	1006	0.03729	
A09	42.50	951	0.02819	
A10	47.50	924	0.02116	
A11	52.50	883	0.01839	
B01	5.00	1578	0.1312	
B02	10.00	1372	0.1123	
B03	15.00	1304	0.09193	
B04	20.00	1198	0.07327	αK_{kr} = 0.0405/min.
B05	25.00	1091	0.06281	Corr. Coeff. = -0.998
B06	30.00	1038	0.05051	
B07	35.00	982	0.04157	
B08	40.00	977	0.03111	
B09	45.00	943	0.02201	
B10	50.00	910	0.02056	
D01	2.50	-	-	
D02	7.50	605	0.1242	
D03	12.50	829	0.1030	
D04	17.50	918	0.7956	αK_{kr} = 0.0457/min.
D05	22.50	914	0.06362	Corr. Coeff. = -0.999
D06	27.00	885	0.05361	
D07	32.50	926	0.03887	
D08	37.50	881	0.03247	
D09	42.50	911	0.02686	
D10	47.50	897	0.01848	
D11	52.50	904	0.01762	

Table 3. (Cont.)

South Cobb Plant (8/4/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^{3} ratio	
E01	5.00	-	-	
E02	10.00	240	0.1028	
E03	15.00	397	0.07990	
E04	20.00	589	0.07049	αK_{kr} = 0.0460/min.
E05	25.00	718	0.05017	Corr. Coeff. - -0.992
E06	30.00	759	0.04214	
E07	35.00	838	0.03640	
E08	40.00	869	0.02408	
E09	45.00	910	0.01987	
E10	50.00	881	0.01579	
E11	55.00	915	0.01092	
E12	60.00	899	0.01254	

Table 3. (Cont.)

South River Plant (I) (8/16/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^3 ratio	
A01	3.33	1807	0.1555	
A02	7.33	1310	0.1400	
A03	12.33	1098	0.1238	
A04	17.33	920	0.1111	
A05	22.33	848	0.09190	
A06	27.33	760	0.08469	αK_{kr} = 0.0248/min.
A07	32.33	679	0.07316	Corr. Coeff. = -0.998
A08	37.33	703	0.06881	
A09	42.33	646	0.05752	
A10	47.33	621	0.05446	
A11	52.33	616	0.04424	
A12	57.33	597	0.04057	
A13	62.33	575	0.03872	
B01	4.83	1206	0.1472	
B02	9.83	1244	0.1328	
B03	14.83	1027	0.1169	
B04	19.83	943	0.1017	
B05	24.83	861	0.08614	αK_{kr} = 0.0244/min.
B06	29.83	824	0.07792	Corr. Coeff. = -0.998
B07	34.83	757	0.07254	
B08	39.83	708	0.06366	
B09	44.83	692	0.05689	
B10	49.83	655	0.04732	
B11	54.83	660	0.04410	
B12	59.83	623	0.03577	
C01	2.33	87	0.1949	
C02	4.83	261	0.1447	
C03	9.83	621	0.1337	
C04	14.83	760	0.1207	
C05	19.83	849	0.1121	
C06	24.83	871	0.09720	αK_{kr} = 0.0228/min.
C07	29.83	864	0.08101	Corr. Coeff. = -0.996
C08	34.83	829	0.07505	
C09	39.83	804	0.06318	
C10	44.83	767	0.05744	
C11	49.83	732	0.05482	
C12	54.83	715	0.04781	
C13	59,83	682	0.04393	

Table 3. (Cont.)

South River Plant (II) (8/24/71)

Spl. (No.)	Time (Mins.)	Tritium (dpm/ml)	Kr^{85}/H^3 ratio	
A01	1.67	1879	0.1676	
A02	6.67	1925	0.1475	
A03	11.67	1556	0.1336	
A04	16.67	1347	0.1195	
A05	21.67	1169	0.1071	
A06	26.67	1056	0.09326	αK_{kr} = 0.0228/min.
A07	31.67	863	0.08380	Corr. Coeff. = -0.999
A08	37.33	846	0.07799	
A09	41.67	770	0.06816	
A10	46.67	654	0.06009	
A11	51.67	658	0.05312	
A12	56.67	601	0.04710	
A13	61.67	541	0.04332	
D01	3.33	191	0.1569	
D02	8.33	494	0.1442	
D03	13.33	770	0.1242	
D04	18.33	965	0.1116	
D05	27.83	902	0.09201	
D06	28.58	919	0.08741	
D07	33.33	912	0.07676	αK_{kr} = 0.0231/min.
D08	38.58	886	0.07524	Corr. Coeff. = -0.996
D09	43.33	861	0.05812	
D10	48.33	804	0.05289	
D11	53.33	795	0.05205	
D12	58.33	776	0.04430	
D13	63.33	710	0.04063	
E01	5.00	47	0.1410	
E02	10.00	269	0.1284	
E03	15.00	504	0.1180	
E04	20.00	636	0.1108	
E05	25.00	703	0.09744	
E06	30.00	771	0.08500	αK_{kr} = 0.0228/min.
E07	36.00	813	0.07756	Corr. Coeff. = -0.997
E08	40.00	836	0.07041	
E09	45.00	847	0.06056	
E10	50.00	844	0.05345	
E11	55.00	840	0.04763	
E12	60.00	789	0.04219	

Table 5. Operational Data, Aeration Basins

Plant	Test	Station	Parameter	
Kenwood	6/25/71	-	Alkalinity-total (as $CaCO_3$)	43 mg/l
			Oxygen (dissolved)	5.3 mg/l
			Solids - filtrable	255 mg/l
			Solids - nonfiltrable	2065 mg/l
			Chemical oxygen demand	1042 mg/l
			Solids-non filtrable-Volatile	1185 mg/l
			pH	6.5
			Manometric BOD_5	260 mg/l
			Mixed liquor suspended solids	100 ml/l
Kenwood	7/2/71	-	Alkalinity-total (as $CaCO_3$)	54 mg/l
			Oxygen (dissolved)	5.0 mg/l
			Solids - filtrable	280 mg/l
			Solids - nonfiltrable	805 mg/l
			Chemical oxygen demand	827 mg/l
			Solids - nonfiltrable-volatile	490 mg/l
			pH	7.1
			Manometric BOD_5	160 mg/l
			Mixed liquor suspended solids	50 ml/l
Kenwood	7/9/71	-	Alkalinity-total (as $CaCO_3$)	57 mg/l
			Oxygen (dissolved)	6.1 mg/l
			Solids - filtrable	252 mg/l
			Solids - nonfiltrable	542 mg/l
			Solids-nonfiltrable-volatile	298 mg/l
			Chemical oxygen demand	419 mg/l
			pH	6.9
			Manometric BOD_5	145 mg/l
			Mixed liquor suspended solids	12 ml/l
S. Cobb	7/15/71	-	Waste flow	0.65 mgd
			Sludge recycle flow	0.20 mgd
			Mixed liquor suspended solids	600 ml/l
S. Cobb	7/22/71	-	Waste flow	0.70 mgd
			Sludge recycle flow	0.21 mgd
			Mixed liquor suspended solids	560 ml/l

Table 5. (Cont.)

Plant	Test	Station	Parameter	
S. Cobb	8/4/71	-	Waste flow	0.65 mgd
		-	Sludge recycle flow	0.20 mgd
		A	Mixed liquor susp. solids	550 ml/l
		B	" " " " " " " " "	460 ml/l
		D	" " " " " " " " "	560 ml/l
		E	" " " " " " " " "	440 ml/l
S. River(I)	8/16/71	-	Waste flow	4.5 mgd
			Sludge recycle flow	1.2 mgd
			Mixed liquor susp. solids	100 ml/l
			Oxygen (dissolved)	1.9 mg/l
			Air flow (standard)	2.1 mcfd
S. River(II)	8/24/71	-	Waste flow	4.3 mgd
			Sludge recycle flow	1.2 mgd
			Mixed liquor susp. solids	110 ml/l
			Oxygen (dissolved)	1.7 mg/l
			Air flow (standard)	2.1 mcfd